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CANADA BRICK QUARRY SURFACE WATER SURVEY NINTH ANNUAL REPORT 1989-1990

Report No. 90-343-K

D.H. Barber & A.Z. Mlynarczyk
Water Research Unit
Process Chemistry Section

ABSTRACT

Between December 1981 and December 1986, ash from Lakeview TGS was used as fill in the Canada Brick Quarry (formerly Domtar Quarry) in Mississauga, Ontario. As a condition of approval for this disposal, an annual survey of the water quality in Mary Fix Creek, which traverses the site, is required. This report contains historical data from previous surveys and the results of chemical analyses performed on the following sets of samples: creek water collected on 14 November 1989, creek and pond water collected on 5 April 1990, and creek and pond water collected on 13 September 1989. The upstream water does not meet the Provincial Water Quality Objectives for iron, copper, and zinc. The data indicate that the creek water has been mixed with a combination of deep ground water and ash leachate intermittently between 1982 and 1990. This mixing has not caused the site effluent to exceed Provincial Water Quality Objectives for toxic metals; however, the bicarbonate alkalinity has, on occasions, been reduced significantly from upstream levels.

job	file	date	report no.
31-126-892	837.71	December 21, 1990	90-343-K

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EXECUTIVE SUMMARY

CANADA BRICK QUARRY
SURFACE WATER SURVEY
NINTH ANNUAL REPORT 1989-1990

D.H. Barber & A.Z. Mlynarczyk
Water Research Unit
Process Chemistry Section

As a condition of approval to dispose of Lakeview TGS ash at the Canada Brick Quarry (formerly Domtar Quarry) in Mississauga, Ontario, an annual survey of water quality in Mary Fix Creek is required. The creek traverses the site. This report contains chemical analysis data for samples collected on 13 September 1989, 14 November 1989 and 5 April 1990 as well as historical data from previous years. The upstream water does not meet the Provincial Water Quality Objectives for copper, iron, and (more recently) zinc. During the current year, the drainage of ponded water from the site through a former stream course to the new creek alignment allowed mixing of creek water with a combination of deep ground water and ash leachate. Similar mixing has been intermittent between 1982 and 1990. The ash leachate component has not caused the site effluent to exceed Provincial Water Quality Objectives for toxic metals, however, the bicarbonate alkalinity has, on occasions, been reduced significantly from upstream levels. Surface water quality objectives refer to unfiltered samples; therefore, a reduction in the chemical analysis of filtered samples has been implemented.

D.H.B | A.Z.M. | DNB

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TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION	1
2.0 SAMPLING	1
3.0 DISCUSSION	3
3.1 EXISTING UPSTREAM WATER QUALITY	3
3.2 CHEMICAL ANALYSIS AND MAJOR ION CHEMISTRY	3
3.3 FILTERED AND UNFILTERED SAMPLES	5
4.0 CONCLUSIONS AND RECOMMENDATIONS	6
REFERENCES	8
APPENDICES	
A SAMPLING PROTOCOL	A-1 to A-2
B CHEMICAL ANALYSIS	B-1 to B-25
C ION BALANCES AND PIPER DIAGRAMS	C-1 to C-20
DISTRIBUTION	last page

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CANADA BRICK QUARRY SURFACE WATER SURVEY
NINTH ANNUAL REPORT, 1989-1990

1.0 INTRODUCTION

Lakeview TGS fly ash was disposed of at Canada Brick Quarry (formerly Domtar Quarry) at the North-East corner of Mavis Road and Dundas Street West in Mississauga, Ontario, between December 1981 and December 1986. As a condition of Provisional Certificate of Approval Number A220113, an annual surface water survey is required. The purpose of the survey is to assess the effects of ash disposal on the water quality in the Mary Fix Creek . The certificate identifies the substances for which analysis is required. This year's report contains the historical data from the eight previous surveys /ref. 1 to 8/ as well as results of analyses of samples collected on 14 November 1989 and 5 April 1990. The 1987 to 1989 surveys /ref. 7 and 8/ identified reasons to suspect that occasional discharges from on-site ponds through the old creek course might be affecting creek water chemistry. It was postulated that the water in these ponds might be a mixture of deep ground water and ash leachate. In anticipation of sampling surface water ponds and the old creek course in 1990, a preliminary sampling and analysis of the clean water pond, the old creek course and two creek locations was carried out in September 1989. Sampling of surface water ponds and the old creek course was also carried out in conjunction with the 5 April 1990 sampling.

2.0 SAMPLING

Four locations (shown in Figure 1) were used for both major samplings during this reporting period. The locations, listed from the upstream end, are the Canadian Pacific Overpass (CPO), the South Property Fence (SPF), Dundas Street Culvert (DSC) and Paisley Street Bridge(PSB). Surface water samples were collected at these locations on 14 November 1989. The sampling protocol is described in Appendix A. Chemical analyses were performed by Analytic Services Section of Ontario Hydro Research Division. Both filtered and unfiltered samples were analysed. The practice

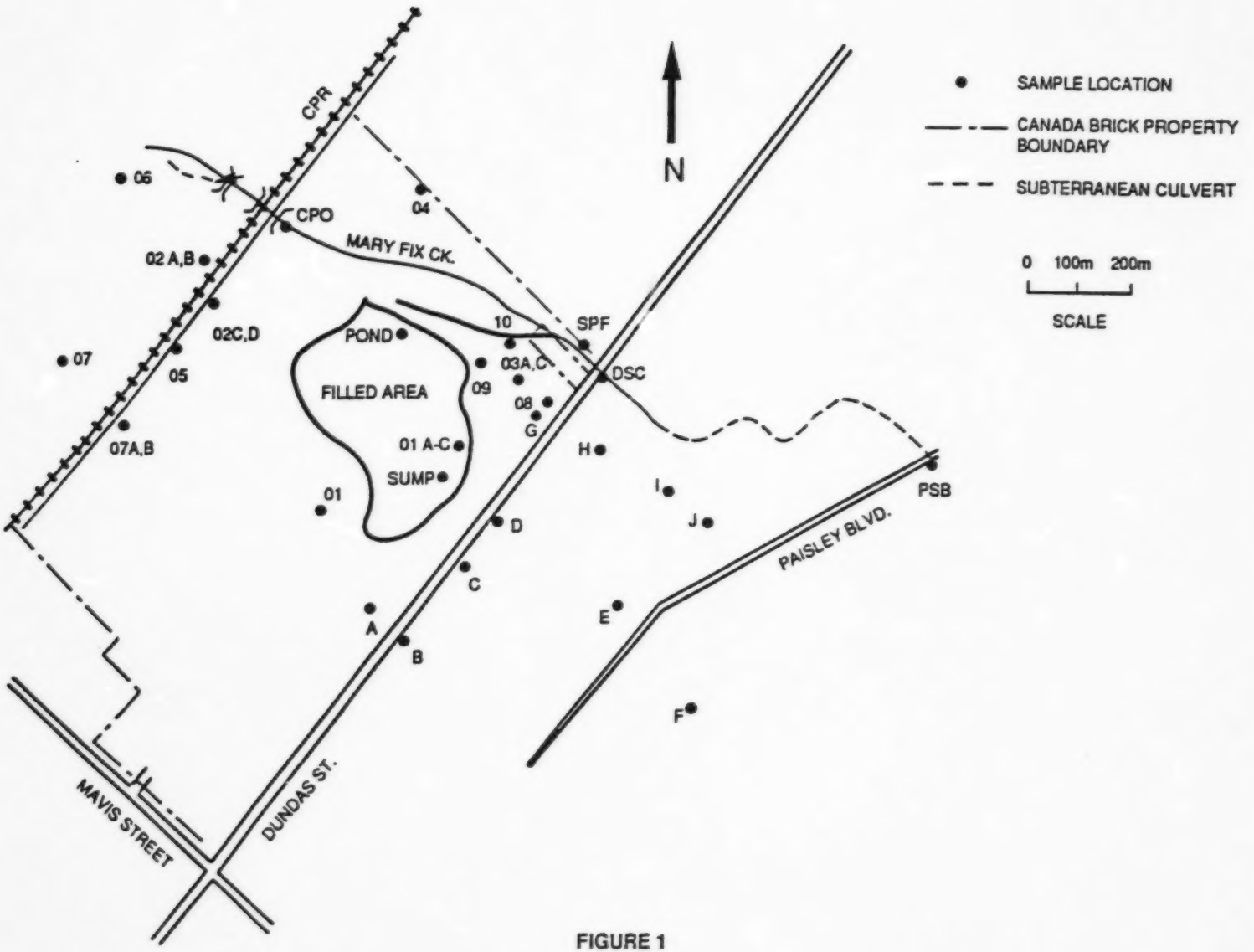

FIGURE 1

CANADA BRICK QUARRY
FLY ASH DISPOSAL PROJECT

of dating unfiltered samples as the day following actual sampling has continued, except for the September 1989 sampling for which only unfiltered samples were analysed. This practice allows selective computer retrieval of data for filtered or unfiltered samples. The weather in the few days prior to the November 1989 sampling had been stormy and wet. These post-storm conditions correspond to high flow conditions.

For the 5 April 1990 sampling, new sampling location were added. These are the Old Creek Course (OCC) at its intersection with Mary Fix Creek, the "Clean Water Pond" (identified as POND in Figure 1), the SUMP, the pond adjacent to the SUMP, (identified as SPD in the Appendices), and the high pond (HPD) west of well location A. The weather prior to the April 1990 sampling had been dry, cool and clear for a week prior to the sampling. This sampling corresponds to a low flow but non-evaporative condition. Results of chemical analyses for both the filtered and unfiltered portions of samples from both dates are given in Appendix B together with those reported in previous reports. Major ion balances and Piper diagrams are given in Appendix C.

A preliminary sampling at locations CPO, POND, OCC and DSC was performed on 13 September 1989.

3.0 DISCUSSION

3.1 EXISTING UPSTREAM WATER QUALITY

The Provincial Water Quality Objectives /ref. 10/ are presented on page B-3 of Appendix B. The values shown under 'Objective' are existing limits. Some of the values shown under 'Other Limits' are drinking water limits identified as either maximum acceptable concentrations related to health or maximum desirable concentrations related to aesthetic quality. Other values shown under 'Other Limits' are calculated at 5% of the LC50 values listed in the Ontario Ministry of the Environment publication 'Water Management' /ref. 10/. Objectives have not been established for these substances.

Water samples from Mary Fix Creek at the Canadian Pacific railway overpass (CPO) are taken to be indicative of the existing upstream water quality. The results reported for the CPO were compared with the Objectives and other limits shown in Appendix B. Since analysis of unfiltered samples was started in 1983, none of the seventeen unfiltered samples of water from the CPO has met the Provincial Water Quality Objectives. In particular, concentrations of copper, iron, and zinc have frequently been higher than the Objectives. Aluminium concentrations in unfiltered samples have regularly been higher than the 0.1 mg/L guideline value /ref. 10/.

3.2 CHEMICAL ANALYSIS AND MAJOR ION CHEMISTRY

Figure 1 shows the sampling locations in and around the Canada Brick Quarry site and the current course of Mary Fix Creek and

the Mary Fix storm water drainage channel. The second line near the POND is the Old Creek Course. The sampling point on this stream is at the junction of the two streams. The impact of the ash disposal operation is best assessed by considering the changes in water chemistry between the CPO and the SPF (or DSC) for a given sampling date.

The September 1989 analysis data show increases in the concentrations of calcium, sodium, potassium, sulphate, chloride, boron, strontium, arsenic, and a decrease in magnesium, bicarbonate alkalinity, iron, selenium, and nitrate between the CPO and DSC locations. These changes increased higher total dissolved solids and conductivity. The composition of the POND and OCC waters are similar. The changes in the creek water are consistent with mixing of about 70 % POND water and 30 % CPO water to produce the DSC water.

The November 1989 data show increases in the concentrations of calcium, sodium, potassium, sulphate, chloride, boron and strontium between the CPO and SPF locations. The concentration of dissolved magnesium increased between the CPO and SPF locations, but the total magnesium concentration in the unfiltered sample decreased between these points. Apart from the anomalous magnesium trend the major ion chemistry data are consistent with a mixing of 10 % POND water with 90 % CPO water to produce the water at the SPF, assuming that the November 1989 POND water was similar to the September 1989 POND water.

The April 1990 data show decreases in concentrations of calcium, magnesium, sodium, potassium, nitrate and chloride; and increases in concentrations of sulphate, boron, and selenium across the site. These changes are reflected in the decreased conductivity and total dissolved solids, and increased pH. The CPO water has higher concentrations of major ions than in November 1989. The POND water has lower concentrations of major ions than in September 1989. The difference between the major ion chemistries of CPO and POND waters is too small to allow calculation of mixing ratios with much confidence. However, based on the boron and selenium concentrations, it would appear that the mixing of about equal volumes of CPO water and POND water would produce the SPF water.

The mixing ratios calculated from the analysis data are valid only for the time of sampling. The discharge rate of ponded waters is not constant, and the creek flow varies. It is apparent from the calculated mixing ratios that there should have been a significant difference between the flow rate at the Canadian Pacific Overpass and the flow rate at the South Property Fence in September 1989 and April 1990. However, there has been no provision for measuring flow in Mary Fix Creek for some years.

During all three samplings undertaken during this reporting period, water from the Clean Water Pond was being pumped to the Old Creek Course and allowed to drain to the Mary Fix Creek. In early March the pond adjacent to the SUMP was flooded to a

sufficient depth to cover the SUMP casing. However, later in March and in April 1990 the SUMP pond level had dropped below the casing level after some of the ponded water was pumped out.

The April 1990 analysis of SUMP water and SUMP pond water suggest that the SUMP pond contained water similar to the SUMP but diluted with run-off. It is unclear whether the run-off collected first causing the SUMP pond to flood over and into the SUMP or whether the in-ash water rose and overflowed the SUMP casing. The SUMP casing was extended significantly during the summer of 1990 and now extends above the top of grade of the ash. Future flooding of the SUMP casing is unlikely.

The concentrations of boron, strontium, arsenic, selenium and sulphate in High Pond (HPD) in April 1990 were similar to the concentrations of these species in the CPO sample of that time. There is no indication that the High Pond contained ash leachate in April 1990. Therefore, monitoring of the High Pond does not need to be as frequent as other ponds. Furthermore, the analyte list could be restricted to major ions and ash leachate indicators.

The ratios of concentrations of calcium to magnesium, calcium to sodium, and sulphate to chloride in the 'Clean Water Pond' and the SUMP pond waters are lower than those of the in-ash waters reported in the ground water survey /ref. 9/. However, concentrations of ash leachate indicators, boron and selenium, are higher than background levels (CPO water or up-gradient well waters). During field sampling trips water has been observed to flow out of the shale on the sides of the 'Clean Water Pond'. Therefore, the SUMP pond and 'Clean Water Pond' waters contain a mixture of ground waters and ash leachate.

3.3 FILTERED AND UNFILTERED SAMPLES

Between September 1983 and November 1989, analysis was performed on both filtered and unfiltered samples of surface water. In order to meet the requirements of the Water Quality Objectives, analysis of filtered samples for most analyses (except mercury) is not required. However, ion balances assume that the material is dissolved. Historically, the ion balances with errors larger than 10 % have been for the calculations based on unfiltered samples. The analysis of samples for major ion chemistry has continued on both filtered and unfiltered samples. The analyses to date indicates that aluminium, copper, iron, and zinc are largely particulate and not dissolved. Continued analyse for these metals on both filtered and unfiltered samples should allow a change in distribution to be observed. Suspended material in samples analysed by colorimetric methods can cause false high values due to light scattering or opacity. Analysis for chromium(VI) is a colorimetric method and was only performed on a filtered sample. The values reported in the Appendix B as TOC/DOC are Total Organic Carbon (TOC) for unfiltered samples or Dissolved Organic Carbon (DOC) for filtered samples.

4.0 CONCLUSIONS AND RECOMMENDATIONS

1. The surface water in Mary Fix Creek upstream of the Canada Brick Quarry does not meet the Ontario Provincial Water Quality Objectives. Concentrations of copper, iron and zinc exceed Objectives on a regular basis. The concentration of aluminium exceeds the guideline for toxicity to aquatic life.

2. The 'Clean Water Pond' and SUMP pond contain a mixture of ground water and ash leachate.

3. The data indicate that there has been mixing of a combination of ash leachate and deep ground water with the creek flow on an intermittent basis between 1982 and 1990. During the current monitoring period, this mixing resulted from drainage of ponded water through an old creek course into Mary Fix Creek.

4. In order to understand the mixing in the Mary Fix Creek, it is recommended that chemical analysis of unfiltered samples from surface water ponds and the SUMP continue during the next reporting year.

5. Since the High Pond does not contain ash leachate monitoring at that location does not need to be as frequent as other ponds. Furthermore, the analyte list could be restricted to major ions and ash leachate indicators.

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CANADA BRICK QUARRY SURFACE WATER SURVEY
SAMPLING PROTOCOL
1989-90

Canada Brick Surface Water Survey
Sampling Protocol
1989-90

Samples for trace metal analysis, from each location, were collected in specially pretreated, acid-cleaned linear polyethylene (LPE) bottles. Samples for general chemical and anion analysis were collected in non-treated linear polyethylene bottles. These samples were stored in a cooler and returned the same day to the laboratory. Details of sample handling and preservation, prior to submission for detailed chemical analysis, are described below.

(a) Filtered Samples

One sample from each location was filtered in the laboratory through a 0.45um Millipore filter to remove suspended solids. The glass Millipore vacuum filteration apparatus had been cleaned by soaking in 1:1 hydrochloric acid followed by a deionised water rinse and a further soaking in 1:1 nitric acid. This was followed by several thorough rinsings with deionised water. Milllipore filters were rinsed by passing 100 mL of deionised water through the filter and discarding the filtrate. A small volume (20mL) of the sample was passed through the filter and also discarded, then the remaining sample was filtered. The empty original sample container was rinsed several times with deionised water, given a final rinse using a small volume (10mL) of sample filtrate, and reused for storing the unacidified portion. The unacidified portion for pH, alkalinity, conductivity, general chemistry and anion analysis was stored in a refrigerator.

The portion of the filterate for trace metal analysis was acidified with 5 mL of ultrapure reagent nitric acid per litre of sample. The reagent nitric acid had 2mL of BDH assured gold standard added to each litre of ultrapure nitric acid. The gold standard used was 1 g gold per litre in aqua regia. Sample acidity was checked with pH paper to ensure that sample pH was 2 or lower. Gold is added to the nitric acid to preserve mercury in the sample.

(b) Unfiltered Samples

To determine total concentrations of components (in particular, trace metals), samples were submitted for chemical analysis without filteration in accordance with MOE surface water objectives/ref. 10/. A portion of each sample was acidified with ultrapure nitric acid with gold (5mL per litre) and an unacidified portion was stored in a refrigerator (at about 4 C) pending pH, alkalinity, conductivity and anion analysis.

(c) Neutron Activation Analysis

The non-preserved portion was subsampled to obtain a sample for neutron activation analysis.

APPENDIX B

CANADA BRICK SURFACE WATER SURVEY
(MARY FIX CREEK)

CHEMICAL ANALYSIS
1980-1990

Sampling Locations

CPO - Canadian Pacific Overpass (upstream site boundary)
SPF - South Property Fence (downstream site boundary)
DSC - Dundas Street Culvert (near downstream location)
PSB - Paisley Street Bridge (distant downstream location)
POND - Clean Water Pond (On site pond North of filled area)
SPD - SUMP Pond (Ponded water adjacent to SUMP)
HPD - High Pond (Pond in southwest of property)
SUMP - SUMP (Unfiltered sample of SUMP water)
OCC - Old Creek Course (at intersection with new creek alignment)

Ashwater Test Codes Used for Canada Brick Quarry Surface Water
and Analytic Methods Used This Reporting Period

AG	Silver by graphite furnace atomic absorption spectroscopy
AL	Aluminium by inductively coupled plasma
ALKCO3	Carbonate alkalinty by titration (mg $CaCO_3$/L)
ALKHCO3	Bicarbonate alkalinty by titration (mg $CaCO_3$/L)
ALKOH	Hydroxide alkalinty by titration (mg $CaCO_3$/L)
AS	Arsenic by cold vapour atomic absorption spectroscopy
B	Boron by continuous flow colorimetry or inductively coupled plasma
BA	Barium by inductively coupled plasma or neutron activation analysis
BE	Beryllium not analysed this reporting period
BR	Bromine by neutron activation analysis
CA	Calcium by inductively coupled plasma
CD	Cadmium by graphite furnace atomic absorption spectroscopy
CL	Chloride by ion chromatography
CO	Cobalt not analysed this reporting period
COND	Electrical conductivity by electrometry (mS/m)
CR	Chromium by inductively coupled plasma
CR(VI)	Hexavalent chromium by colorimetry
CU	Copper by inductively coupled plasma
FE	Iron by inductively coupled plasma
HARD	Magnesium and calcium hardness calculated from those values (mg $CaCO_3$/L)
HG	Mercury by cold vapour atomic absorption spectroscopy
I	Iodine by neutron activation analysis
K	Potassium by inductively coupled plasma
MG	Magnesium by inductively coupled plasma
MN	Manganese by inductively coupled plasma
MO	Molybdenum by inductively coupled plasma
NA	Sodium by inductively coupled plasma
NI	Nickel by inductively coupled plasma
NO3	Nitrate by continuous flow colorimetry (mg NO_3/L)
PB	Lead by graphite furnace atomic absorption spectroscopy
PH	pH by electrometry (pH units)
SE	Selenium by cold vapour atomic absorption spectroscopy
SIO2	Total silica by colorimetry, expressed as silicon dioxide (mg SiO_2/L)
SO4	Sulphate by ion chromatography (mg SO_4/L)
SR	Strontium by inductively coupled plasma
TDS105	Total dissolved solids at 105 C by gravimetry
TI	Titanium by inductively coupled plasma or neutron activation analysis
TOC/DOC	Total organic carbon by oxidation and infrared spectroscopy
TSS105	Total suspended solids at 105 C by gravimetry
U	Uranium by neutron activation analysis
V	Vanadium by inductively coupled plasma or neutron activation analysis
ZN	Zinc by inductively coupled plasma

Units are mg/L, unless indicated differently above.

Provincial Water Quality Objectives for Substance
Analysed for Canada Brick Surface Water Survey

Substance	Objective (mg/L)	Other Limit (mg/L)	Comments
AG	0.0001		
AL	--	0.1	Guideline for ionised or ionisable Al based on toxicity to aquatic life
ALKCO3	--		Alkalinity should not be decreased
ALKHCO3	--		by more than 25 % of the natural
ALKOH	--		concentration
AS	0.1	0.05	Lower limit drinking water - health
B	--	5.0	Drinking water - health
BA	--	0.5	Guideline 5% of toxicity limit for aquatic invertabrates
BE	0.011		Depends on hardness
BR	--		
CA	--		
CD	0.0002		
CL	--	250	Drinking water - aesthetic
CO	--		
COND	--		
CR	0.1	0.05	Lower limit drinking water - health
CR(VI)	0.1	0.05	No limit specified but this is the form of chromium which is environmentally hazardous
CU	0.005		
FE	0.3		
HARD	--		
HG	0.0002		Total mercury in filtered sample.
I	--		
K	--		
MG	--		
MN	--	0.05	Drinking water - aesthetic
MO	--	3.5	Guideline 5% of lower limit of minnow mortality LC50.
NA	--		
NI	0.025		
NO3	--	44	Drinking water as nitrate (not as nitrogen) - health
PB	0.005		Depends on hardness
PH	6.5 to 8.5		
SE	0.1	0.01	Lower limit drinking water
SIO2	--		
SO4	--	500	Drinking water - aesthetic
SR	--	3.75	Guideline 5% of Daphnia LC50
TDS105	--	500	Drinking water - aesthetic
TI	--		
TOC/DOC	--	5.0	Drinking water - aesthetic
TSS105	--		
U	--	0.02	Interim drinking water limit
V	--	0.5	Guideline 5% of fish mortality LC50
ZN	0.03		

Where objectives depend on hardness, the lowest contaminant limit is given.
Drinking water objectives have been given when lower than surface water objectives or when no limit is specified for surface water.

Table B1

Chemical Characteristics of Canada Brick Quarry Surface Water

Location CPO

Date	800507	811130	820314	820324	820813	820827	820924	830921	830922*
AG	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
AL	--	<0.200	--	<0.200	<0.600	<0.200	<0.500	<0.500	<0.500
ALKCO3	2.00	--	<5.00	<5.00	24.0	<5.00	10.0	26.0	24.0
ALKHCO3	201	110	36.0	86.0	240	64.0	137	163	165
ALKOH	<5.00	--	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	--	0.0010	--	<0.0010	0.0010	<0.0020	<0.0020	<0.0010	<0.0010
B	--	<0.500	--	<1.00	<0.500	<0.500	<1.00	0.160	0.190
BA	--	<1.00	--	<2.00	<8.00	1.00	1.30	<2.00	<0.500
BE	--	--	--	--	<0.0002	<0.0002	<0.0002	--	--
BR	--	0.100	--	<0.200	0.600	<0.200	1.40	0.210	0.590
CA	81.0	57.0	15.0	34.0	116	43.0	72.0	89.0	88.0
CD	--	0.0009	--	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CL	136	40.0	26.0	60.0	177	22.0	85.0	120	130
CO	--	--	--	--	--	--	<0.0500	--	--
COND	94.0	47.0	19.0	39.0	124	35.0	66.0	94.0	94.0
CR	--	<0.100	--	<0.0500	<0.0500	0.0030	<0.0500	<0.100	<0.100
CR(VI)	--	0.0090	--	0.0080	0.0040	--	--	<0.0100	<0.0100
CU	--	0.0030	--	0.0050	0.0040	0.0080	0.0030	0.0040	0.0050
FE	--	<0.0500	--	0.0500	<0.0500	<0.0500	<0.0100	<0.0500	0.460
HARD	303	208	49.0	120	429	142	250	313	315
HG	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
I	--	<0.0100	--	<0.0200	<0.200	<0.0500	<0.0500	<0.0050	<0.0050
K	6.00	4.90	3.90	4.30	4.00	3.40	4.90	0.660	0.670
MG	24.4	16.0	2.70	8.30	34.0	8.40	18.0	22.0	23.0
MN	--	<0.0200	--	0.200	0.240	<0.0200	<0.0200	0.0500	0.0600
MO	--	<0.500	--	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
NA	60.0	20.0	16.0	27.0	97.0	12.0	34.0	71.0	71.0
NI	--	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
NO3	<0.100	<0.100	--	0.100	<0.200	17.0	4.50	<1.00	0.440
PB	--	0.0020	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PH	8.30	8.10	7.00	7.80	8.20	7.90	8.00	8.30	8.20
SE	--	0.0010	--	<0.0010	<0.0020	<0.0020	<0.0020	<0.0010	<0.0010
SIO2	--	5.00	--	3.30	4.80	3.60	7.40	7.47	7.10
SO4	81.0	70.0	14.0	26.0	140	49.0	95.0	95.0	94.0
SR	--	0.130	--	0.140	0.800	0.130	0.280	0.500	0.500
TDS105	--	370	--	260	756	208	380	628	614
TI	--	<0.500	--	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	--	--	--	15.0	22.0	12.0	17.0	6.00	4.00
TSS105	--	22.0	--	--	--	--	31.0	7.00	7.00
U	--	<0.0100	--	<0.0100	<0.0600	<0.0200	<0.0010	<0.0100	<0.0100
V	--	<0.0050	--	<0.0100	<0.0200	<0.0030	<0.500	<0.0050	<0.0050
ZN	--	<0.0200	--	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B1 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location CPO

Date	831017	831018*	840217	840218*	840930	841001*	850702	850703*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
AL	<0.500	6.00	<0.500	6.80	<0.500	1.60	<1.00	<1.00
ALKCO3	<5.00	<5.00	<5.00	<5.00	7.00	<5.00	<5.00	<5.00
ALKHCO3	64.0	68.0	37.0	45.0	95.0	103	218	219
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
B	0.110	0.110	0.0800	0.0500	<0.0500	<0.0500	0.150	0.180
BA	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<5.00	<5.00
BE	--	--	--	--	--	--	--	--
BR	<0.0500	<0.0500	<0.100	<0.100	<0.200	0.200	0.900	<0.500
CA	29.0	31.0	21.4	26.9	34.7	46.1	130	129
CD	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
CL	24.0	24.0	61.5	66.1	99.0	98.0	639	572
CO	--	--	--	--	--	--	--	--
COND	28.3	28.6	34.0	34.0	62.0	61.0	241	240
CR	<0.100	<0.100	<0.0500	<0.0500	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0030	0.0100	0.0090	0.0120	0.0020	0.0080	0.0070	0.0090
FE	0.130	5.60	0.100	9.60	<0.100	0.880	<0.0500	0.180
HARD	96.0	119	71.0	116	137	166	494	491
HG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.0002
I	<0.0050	<0.0050	<0.0500	<0.0500	0.0600	<0.0600	<0.100	<0.100
K	4.90	6.30	3.10	7.30	4.87	5.49	6.75	6.48
MG	5.70	7.80	4.30	7.70	12.2	12.5	40.7	41.2
MN	<0.0500	0.260	0.0800	0.340	<0.0500	<0.0500	0.0980	0.0980
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	0.500
NA	16.0	16.0	35.0	33.0	34.6	47.8	310	313
NI	<0.0050	0.0060	<0.0050	0.0100	<0.0050	<0.0050	<0.0100	<0.0100
NO3	0.0200	1.43	4.09	4.20	0.130	0.0900	--	<0.0090
PB	0.0020	0.0160	<0.0020	0.0080	<0.0020	<0.0020	<0.0050	<0.0050
PH	7.90	7.70	7.40	7.50	7.90	7.60	8.30	8.30
SE	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
SIO2	3.89	3.70	2.94	12.0	2.70	8.50	1.41	2.06
SO4	30.0	29.0	17.3	18.3	44.0	43.0	151	140
SR	0.120	0.150	0.100	0.130	0.340	0.340	1.22	1.22
TDS105	190	190	222	230	392	378	1460	1350
TI	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	8.00	10.0	12.4	12.3	25.0	25.0	30.0	27.5
TSS105	--	15.0	--	387	--	--	--	3.10
U	<0.0500	<0.0500	<0.0100	<0.0100	<0.0500	<0.0500	<0.100	<0.100
V	<0.0050	<0.0050	<0.0050	0.0300	<0.0100	<0.0100	<0.100	<0.0500
ZN	<0.0200	0.0400	<0.0200	0.0300	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B1 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location CPO

Date	851005	851006*	860618	860619*	861008	861009*	870403	870404*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002
AL	<1.00	3.30	<1.00	22.7	<1.00	32.0	<1.00	2.00
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
ALKHCO3	107	90.0	188	188	162.	160.	137.	138.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	<0.0010	<0.0010	0.0010	0.0050	<0.0010	0.0020	0.0012	0.0021
B	0.100	0.160	0.130	0.170	0.210	0.220	0.150	0.200
BA	<0.500	<0.500	<0.500	<0.500	<8.00	<60.0	<15.0	<15.0
BE	--	--	--	--	--	--	--	--
BR	<0.100	<0.100	0.300	<0.500	0.700	2.00	<5.00	<10.0
CA	39.1	40.9	74.0	88.0	69.0	138.	69.0	72.0
CD	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	0.0002	<0.0001	<0.0001
CL	43.6	42.2	193	192	118.	120.	220.	240.
CO	--	--	--	--	--	--	--	--
COND	40.5	40.0	114	114	78.0	77.5	114.	116.
CR	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0040	0.0030	0.0060	0.0450	0.0120	0.130	0.0040	0.0100
FE	0.100	1.95	<0.0500	38.0	<0.0500	40.0	<0.100	3.20
HARD	134	143	273	421	252.	500.	254.	270.
HG	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0007	0.0002	<0.0002
I	<0.0500	<0.0600	<0.100	<0.300	<0.200	<2.00	<0.500	<0.500
K	4.61	4.95	5.00	7.50	6.70	10.0	5.00	5.10
MG	8.93	9.96	21.7	32.5	19.5	38.0	20.0	21.0
MN	<0.0500	0.0500	0.0500	0.700	<0.0500	1.06	0.0600	0.130
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
NA	28.9	29.3	105	104	67.0	69.0	119.	122.
NI	<0.0050	<0.0050	<0.0050	0.0440	<0.0050	0.158	<0.0050	0.0050
NO3	0.337	1.86	1.23	1.70	1.80	1.75	3.80	3.91
PB	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050	0.0080	<0.0020	<0.0020
PH	7.80	7.30	8.10	7.90	8.30	8.40	8.27	8.06
SE	0.0010	0.0030	0.0010	0.0030	0.0070	0.0200	0.0010	0.0020
SIO2	0.620	3.13	6.25	--	6.70	75.0	5.05	13.5
SO4	38.5	37.7	67.0	70.0	78.0	112.	99.0	99.0
SR	0.400	0.320	0.700	0.780	0.770	1.00	0.730	0.710
TDS105	252	239	550	650	472.	466.	763.	731.
TI	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	12.0	9.00	30.0	45.0	8.00	6.00	8.20	8.30
TSS105	--	14.0	--	--	--	3800	--	--
U	<0.0500	<0.0200	0.0200	<0.100	<0.0600	<2.00	<0.200	<0.200
V	<1.00	<1.00	<0.0100	0.180	<0.0100	1.50	<0.0500	<0.0500
ZN	<0.0200	0.0200	<0.0200	0.100	<0.0200	0.140	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B1 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location CPO

Date	870625	870626*	871008	871009*	880425	880831	880901*	881027	881028*
AG	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0001	<0.0001	<0.0002	<0.0002
AL	<1.00	<1.00	<1.00	5.00	--	<0.0600	<0.0600	<0.0600	0.280
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
ALKHCO3	200.	197.	220.	230.	276.	291.	292.	233.	237.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	<0.0010	<0.0010	<0.0010	<0.0010	--	<0.0010	<0.0010	<0.0010	0.0020
B	0.350	0.350	1.17	1.19	0.800	0.700	0.800	0.590	1.10
BA	<2.00	<2.00	<5.00	<3.00	--	<3.00	<3.00	0.0500	0.0500
BE	--	--	--	--	--	--	--	--	--
BR	<0.500	0.500	3.50	4.00	--	2.40	2.30	0.500	0.400
CA	100.	100.	105.	107.	162.	173.	150.	102.	101.
CD	<0.0001	<0.0001	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0002	<0.0002
CL	233.	231.	432.	432.	600.	430.	430.	212.	201.
CO	--	--	--	--	--	--	--	--	--
COND	146.	145.	205.	210.	--	210.	215.	135.	138.
CR	<0.100	<0.100	<0.100	<0.100	--	<0.0200	<0.0200	<0.0200	<0.0200
CR(VI)	--	<0.0050	<0.0050	<0.0050	--	<0.0100	<0.0100	<0.0020	0.0320
CU	0.0040	0.0060	0.0030	0.0100	--	<0.0050	<0.0050	<0.0050	<0.0050
FE	<0.0500	0.910	<0.0500	8.00	--	<0.0200	<0.0200	0.0700	0.340
HARD	394.	398.	459.	477.	--	628.	571.	390.	390.
HG	0.0007	<0.0002	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0001	<0.0001
I	<0.0500	<0.0500	<0.200	<0.100	--	<0.500	<0.500	<0.100	<0.100
K	14.0	14.0	17.0	17.0	16.0	15.0	17.0	14.0	14.0
MG	35.0	36.0	48.0	52.0	60.0	48.0	48.0	33.0	33.0
MN	<0.0500	0.0600	0.100	0.260	--	0.0400	0.0400	0.0200	0.0300
MO	<0.500	<0.500	<0.500	<0.500	--	<0.0300	<0.0300	0.0800	<0.0500
NA	141.	140.	234.	238.	311.	203.	208.	128.	138.
NI	<0.0050	<0.0050	<0.0050	0.0050	--	<0.0100	<0.0100	<0.0100	<0.0100
NO3	6.50	6.60	5.96	7.79	--	10.3	10.3	8.94	8.03
PB	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0020	<0.0020	<0.0020	<0.0020
PH	8.30	8.20	8.38	8.21	7.60	8.10	8.20	7.98	7.70
SE	<0.0010	<0.0010	0.0030	0.0030	--	<0.0010	<0.0010	<0.0010	<0.0010
SIO2	6.80	6.35	4.12	54.5	--	8.20	9.10	7.28	9.34
SO4	149.	141.	203.	194.	247.	230.	220.	169.	166.
SR	1.65	1.66	3.00	3.00	3.50	2.80	3.39	2.06	2.37
TDS105	928.	904.	1310	1320	1590	1380	1360	840.	856.
TI	<1.00	<1.00	<1.00	<1.00	--	<0.0500	<0.0500	<0.0500	<0.0500
TOC/DOC	7.70	7.70	<0.500	<0.500	--	2.00	1.80	1.94	0.880
TSS105	--	--	--	285.	0.800	--	6.00	--	16.5
U	<0.0200	<0.0200	<0.0500	<0.0300	--	<0.0600	<0.0600	0.0300	0.0400
V	<0.0100	<0.0100	<0.0200	<0.0100	--	<0.0400	<0.0400	<0.0100	<0.0100
ZN	<0.0200	<0.200	0.0200	0.0400	--	0.0800	0.0800	0.0200	0.0300

* Unfiltered sample dated one day after actual sampling.

Table B1 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location CPO

Date	890425	890426*	890913**	891114	891115*	900405	900406*
AG	0.0003	<0.0002	--	<0.0002	0.0003	--	<0.0002
AL	<0.0600	1.20	--	<0.0600	16.0	0.200	0.240
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	8.00	<5.00
ALKHCO3	182.	183.	256.	53.0	84.1	207.	212.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0023	<0.0010	<0.0010	0.0013	0.0028	--	<0.0010
B	0.400	0.300	1.00	<0.100	<0.100	2.00	0.350
BA	<0.0500	<0.0500	--	<0.0500	0.0700	--	<0.0500
BE	--	--	--	--	--	--	--
BR	--	0.800	--	<0.500	<0.500	--	1.00
CA	106.	106.	133.	34.0	59.0	128.	134.
CD	<0.0002	<0.0002	--	<0.0002	0.0004	--	<0.0002
CL	394.	460.	454.	65.0	46.0	475.	477.
CO	--	--	--	--	--	--	--
COND	204.	205.	222.	40.5	42.0	227.	229.
CR	<0.0200	<0.0200	--	<0.0200	<0.0200	0.0300	0.0200
CR(VI)	<0.0100	<0.0100	--	<0.0050	<0.0050	<0.0050	--
CU	<0.0050	0.0080	--	0.0060	0.0400	0.0280	0.0260
FE	<0.0200	1.27	0.470	<0.0200	32.0	0.0400	0.170
HARD	412.	412.	558.	125.	258.	508.	535.
HG	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	--
I	--	<0.200	--	<0.300	<0.300	--	<0.200
K	13.0	14.0	22.0	5.50	9.00	14.0	15.0
MG	36.0	36.0	55.0	10.0	27.0	46.0	49.0
MN	<0.0100	0.120	--	0.0200	0.580	--	0.0400
MO	<0.0500	<0.0500	--	0.0700	0.0800	--	<0.0500
NA	228.	229.	243.	32.0	33.0	306.	306.
NI	<0.0100	<0.0100	--	<0.0100	0.0300	--	0.0200
NO3	9.57	9.12	11.5	7.77	7.60	10.1	10.4
PB	<0.0050	<0.0050	--	<0.0002	0.0200	--	<0.0050
PH	8.06	7.74	7.84	8.05	7.94	8.18	8.11
SE	0.0020	<0.0010	0.0102	<0.0020	<0.0020	--	<0.0010
SIO2	5.60	33.3	--	2.92	151.	1.17	1.30
SO4	248.	170.	219.	53.5	54.2	187.	195.
SR	1.58	1.94	3.00	0.370	0.440	2.30	2.00
TDS105	1260	1250	1420	48.0	571.	1590	1420
TI	<0.0500	<0.0500	--	<0.0500	0.140	--	<0.0500
TOC/DOC	15.2	13.0	--	9.76	8.85	5.40	5.60
TSS105	--	45.0	22.0	--	930.	--	14.0
U	--	<0.0300	--	<0.0500	<0.0500	--	<0.0300
V	<0.0500	<0.0200	--	<0.0500	0.150	--	<0.0200
ZN	0.0300	0.0400	--	0.0200	0.190	0.0400	0.0400

* Unfiltered sample dated one day after actual sampling.

** Unfiltered sample dated day of sampling.

Table B2

Chemical Characteristics of Canada Brick Quarry Surface Water

Location SPF

Date	800507	811130	820314	820324	820813	820827	820924	830921	830922*
AG	--	0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
AL	--	<0.200	--	<0.200	<3.00	<0.200	<0.500	<0.500	<0.500
ALKCO3	5.60	--	<5.00	<5.00	14.0	<5.00	13.0	14.0	25.0
ALKHCO3	190	110	40.0	83.0	99.0	63.0	120	117	107
ALKOH	<5.00	--	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	--	0.0010	--	<0.0010	<0.0010	<0.0020	<0.0020	0.0010	0.0010
B	--	<0.500	--	<1.00	2.50	<0.500	<1.00	2.10	2.11
BA	--	<1.00	--	<2.00	<40.0	1.00	1.40	<2.00	<2.00
BE	--	--	--	--	<0.0002	<0.0002	<0.0002	--	--
BR	--	0.100	--	<0.200	16.0	0.300	1.50	12.0	12.0
CA	79.0	57.0	17.0	33.0	259	45.0	72.0	207	208
CD	--	0.0002	--	<0.0010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CL	122	42.0	34.0	55.0	1700	41.0	215	1200	1130
CO	--	--	--	--	--	--	<0.0500	--	--
COND	90.0	50.0	23.3	36.5	600	43.0	107	445	445
CR	--	<0.100	--	<0.0500	<0.0500	0.0040	<0.0500	<0.100	<0.100
CR(VI)	--	0.0050	--	<0.0050	0.0040	--	--	<0.0100	<0.0100
CU	--	0.0030	--	0.0050	0.0070	0.0070	0.0030	0.0030	0.0040
FE	--	0.0500	--	0.0500	<0.0500	<0.0500	<0.100	<0.0500	0.410
HARD	291	215	56.0	116	869	148	250	707	712
HG	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
I	--	<0.0100	--	<0.0200	<1.00	<0.0500	<0.0500	<0.0200	<0.0200
K	5.00	5.40	4.00	4.60	42.0	4.10	9.80	35.0	35.0
MG	22.8	16.0	3.30	8.10	54.0	8.60	18.0	46.0	47.0
MN	--	<0.0200	--	0.200	0.0400	<0.0200	<0.0200	0.0500	0.0600
MO	--	0.500	--	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
NA	61.0	26.0	19.0	28.0	900	2.90	105	630	640
NI	--	<0.0050	--	<0.0050	0.0120	<0.0050	<0.0050	<0.0050	<0.0050
NO3	<0.100	<0.100	--	0.100	15.0	21.0	8.00	13.0	10.1
PB	--	<0.0020	--	0.0200	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PH	8.50	8.20	7.40	7.90	8.20	7.90	8.10	8.20	8.10
SE	--	<0.0010	--	<0.0010	<0.0020	<0.0020	<0.0020	0.0030	0.0030
SIO2	--	6.50	--	3.80	2.60	4.00	6.80	4.67	3.98
SO4	78.0	72.0	14.0	23.0	450	63.0	145	330	330
SR	--	0.130	--	0.140	4.80	0.200	0.640	2.85	2.85
TDS105	--	370	--	252	3770	260	620	2810	2680
TI	--	<0.500	--	<1.00	<10.0	<1.00	<1.00	<1.00	<1.00
TOC/DOC	--	--	--	15.0	9.00	10.0	17.0	12.0	14.0
TSS105	--	41.0	--	--	--	--	85.0	15.0	15.0
U	--	<0.0100	--	<0.0100	<0.300	<0.0200	<0.0010	<0.0500	<0.0500
V	--	<0.0050	--	<0.0100	<0.100	<0.0030	<0.500	<0.0200	<0.0200
ZN	--	<0.0200	--	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B2 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location SPF

Date	831017	831018*	840217	840218*	840930	841001*	850702	850703*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
AL	<0.500	23.0	<0.500	9.00	<0.500	1.90	<1.00	<1.00
ALKCO3	<5.00	<5.00	<5.00	<5.00	9.00	<5.00	<5.00	<5.00
ALKHCO3	67.0	94.0	39.0	50.0	94.0	103	137	138
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0050	<0.0010	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	<0.0010
B	0.200	0.200	0.0700	0.0700	0.150	0.200	3.04	3.05
BA	<1.00	<1.00	<1.00	<1.00	<2.00	3.00	<5.00	<5.00
BE	--	--	--	--	--	--	--	--
BR	0.150	0.250	<0.100	0.200	0.500	0.500	12.0	12.0
CA	29.0	40.0	22.0	35.0	35.7	49.9	261	264
CD	0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
CL	35.0	35.0	65.4	66.6	125	118	1420	1310
CO	--	--	--	--	--	--	--	--
COND	34.0	34.1	36.0	37.0	70.0	70.0	505	505
CR	<0.100	<0.100	<0.0500	<0.0500	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0030	0.0300	0.0030	0.0170	0.0080	0.0070	0.0060	0.0040
FE	0.130	38.0	0.0900	16.0	<0.100	1.48	<0.0500	0.351
HARD	97.0	250	73.0	159	120	164	881	900
HG	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	0.0007	0.0003	0.0002
I	<0.0050	<0.0050	<0.0500	<0.0500	<0.0600	<0.0600	<0.100	<0.200
K	6.20	9.20	3.40	8.30	3.98	5.45	40.4	42.5
MG	6.10	20.0	4.50	10.5	7.50	9.60	55.9	58.6
MN	<0.0500	0.750	0.0800	0.460	<0.0500	<0.0500	0.0500	0.0500
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.27	1.27
NA	27.0	27.0	43.0	36.0	49.4	70.8	720	725
NI	<0.0050	0.0240	<0.0050	0.0100	<0.0050	<0.0050	<0.0100	<0.0100
NO3	1.36	2.21	3.94	4.91	0.180	0.130	--	83.7
PB	0.0020	0.0210	<0.0020	0.0100	<0.0020	<0.0020	<0.0050	<0.0050
PH	7.50	7.80	7.30	7.60	7.90	7.70	8.20	8.20
SE	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0040	0.0020
SIO2	3.66	3.64	3.11	103	2.70	9.80	3.45	10.2
SO4	38.0	36.0	18.5	19.6	50.0	45.6	768	718
SR	0.190	0.280	0.120	0.160	0.490	0.520	5.95	5.95
TDS105	220	240	230	244	423	430	3440	3250
TI	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	13.0	12.0	11.8	13.5	19.0	21.0	25.0	26.5
TSS105	--	31.0	--	590	--	--	--	35.2
U	<0.0500	<0.0500	<0.0100	<0.0100	<0.0500	<0.0500	<0.100	<0.100
V	<0.0050	0.0170	<0.0050	0.0800	<0.0100	<0.0100	<0.100	<0.0500
ZN	<0.0200	0.120	<0.0200	0.0400	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B2 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location SPF

Date	851005	851006*	860618	860619*	861008	861009*	870403	870404*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002
AL	<1.00	3.30	<1.00	5.00	<1.00	6.00	<1.00	3.30
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
ALKHCO3	88.0	90.0	187	189	131.	131.	135.	138.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0020	0.0030	<0.0010	<0.0010	<0.0010	0.0030	0.0012	0.0017
B	0.230	0.270	0.270	0.310	1.14	1.15	0.210	0.240
BA	<0.500	<0.500	<0.500	<0.500	<8.00	<8.00	<15.0	<15.0
BE	--	--	--	--	--	--	--	--
BR	<0.100	0.200	0.400	0.500	1.70	1.20	<5.00	<10.0
CA	41.4	42.5	72.7	75.0	86.0	86.0	68.0	71.0
CD	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	0.0001
CL	51.1	51.5	215	210	162.	164.	222.	244.
CO	--	--	--	--	--	--	--	--
COND	46.5	47.5	120	122	110.	113.	115.	118.
CR	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0030	0.0030	0.0070	0.0150	0.0050	0.0300	0.0040	0.0100
FE	0.0500	2.29	<0.0500	4.20	<0.0500	9.50	<0.100	6.00
HARD	141	148	268	289	290.	300.	252.	267.
HG	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002
I	<0.0500	<0.0500	<0.100	<0.300	<0.200	<0.200	<0.500	<0.500
K	5.95	6.21	5.87	7.80	16.0	17.0	5.80	6.10
MG	9.19	10.2	21.2	23.2	18.5	21.0	20.0	22.0
MN	<0.0500	0.0500	<0.0500	0.0900	<0.0500	0.160	0.0500	0.180
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
NA	40.8	38.3	130	130	113.	114.	128.	129.
NI	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0240	<0.0050	0.0050
NO3	0.0350	3.89	3.08	2.77	3.61	3.84	4.60	4.90
PB	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020
PH	7.50	7.30	8.30	8.30	8.30	8.20	8.29	8.11
SE	0.0040	0.0030	0.0010	<0.0010	0.0080	0.0050	0.0017	0.0021
SIO2	0.210	25.3	5.15	5.05	4.00	4.60	4.40	21.0
SO4	58.4	55.5	85.0	88.0	229.	228.	102.	104.
SR	0.310	0.350	0.770	0.780	1.47	1.52	0.730	0.730
TDS105	243	276	600	700	684.	670.	735.	752.
TI	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	9.00	10.0	23.0	25.0	6.00	6.00	7.50	8.20
TSS105	--	165	--	--	--	445.	--	--
U	<0.0500	<0.0200	0.0200	<0.0500	<0.0600	<0.0600	<0.200	<0.200
V	<1.00	<1.00	<0.0100	0.0200	<0.0100	0.0600	<0.0500	<0.0500
ZN	<0.0200	0.0400	<0.0200	<0.0200	<0.0200	0.0300	<0.0200	0.0300

* Unfiltered sample dated one day after actual sampling.

Table B2 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location SPF

Date	870625	870626*	871008	871009*	880425	880831	880901*	881027	881028*
AG	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0001	<0.0001	<0.0002	<0.0002
AL	<1.00	<1.00	<1.00	<1.00	--	<0.0600	<0.0600	<0.0600	0.360
ALKCO3	<5.00	<5.00	<5.00	9.90	<5.00	<5.00	<5.00	<5.00	<5.00
ALKHCO3	174.	171.	86.0	80.1	221.	220.	220.	212.	206.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	<0.0010	<0.0010	<0.0010	<0.0010	--	<0.0010	<0.0010	0.0020	0.0010
B	0.440	0.440	4.04	4.07	0.900	0.800	0.900	0.780	1.29
BA	<2.00	<2.00	<5.00	<3.00	--	<3.00	4.20	0.0500	0.0500
BE	--	--	--	--	--	--	--	--	--
BR	0.500	<0.500	5.10	5.00	--	2.50	2.80	0.600	0.500
CA	90.0	91.0	190.	183.	147.	145.	105.	88.0	97.0
CD	<0.0001	<0.0001	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0002	<0.0002
CL	245.	232.	610.	610.	689.	430.	430.	243.	237.
CO	--	--	--	--	--	--	--	--	--
COND	142.	142.	298.	298.	--	208.	203.	142.	140.
CR	<0.100	<0.100	<0.100	<0.100	--	--	<0.0200	<0.0200	<0.0200
CR(VI)	--	<0.0050	<0.0050	<0.0050	--	<0.0100	<0.0100	<0.0020	0.0240
CU	0.0040	0.0050	0.0030	0.0030	--	<0.0050	<0.0050	<0.0050	<0.0050
FE	<0.0500	0.550	<0.0500	0.260	--	<0.0200	0.0300	<0.0200	0.340
HARD	351.	354.	630.	616.	--	538.	438.	342.	378.
HG	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0001	<0.0001
I	<0.0500	<0.0500	<0.200	0.200	--	<0.500	<0.500	<0.100	<0.100
K	16.0	16.0	41.0	41.0	18.0	17.0	16.0	15.0	15.0
MG	31.0	31.0	38.0	39.0	58.0	43.0	43.0	30.0	33.0
MN	<0.0500	<0.500	<0.0500	<0.0500	--	<0.0100	0.0400	<0.0100	<0.0100
MO	<0.500	<0.500	1.00	1.00	--	<0.0300	<0.0300	<0.0500	<0.0500
NA	152.	148.	361.	375.	359.	233.	221.	150.	167.
NI	<0.0050	<0.0050	<0.0050	0.0050	--	<0.0100	<0.0100	<0.0100	<0.0100
NO3	6.80	6.90	13.5	13.6	--	10.6	10.7	7.56	7.49
PB	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0020	<0.0020	<0.0020	<0.0020
PH	8.40	8.40	8.37	8.44	8.10	8.30	8.30	8.38	8.04
SE	<0.0010	<0.0010	0.0120	0.0110	--	<0.0010	<0.0010	<0.0010	<0.0010
SIO2	5.55	5.30	1.85	2.75	--	2.40	2.70	4.19	6.17
SO4	154.	147.	919.	646.	246.	230.	230.	187.	187.
SR	1.59	1.66	4.70	4.60	3.00	2.70	2.75	2.23	2.25
TDS105	932.	924.	2080	2070	1590	1300	1290	882.	900.
TI	<1.00	<1.00	<1.00	<1.00	--	<0.0500	<0.0500	<0.0500	<0.0500
TOC/DOC	7.10	6.70	3.80	<0.500	--	2.30	2.10	2.24	<0.500
TSS105	--	--	--	6.80	2.40	--	2.00	--	26.0
U	<0.0200	<0.0200	<0.0500	<0.0300	--	<0.0600	<0.0600	0.0300	0.0300
V	<0.0100	<0.0100	<0.0200	<0.0100	--	<0.0400	<0.0400	<0.0100	<0.0100
ZN	<0.0200	<0.200	0.0200	0.0200	--	<0.0100	0.0100	<0.0100	0.0200

* Unfiltered sample dated one day after actual sampling.

Table B2 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location SPF

Date	890425	890426*	890913	891114	891115*	900405	900406*
AG	<0.0002	<0.0002	--	<0.0002	0.0003	--	<0.0002
AL	0.0700	0.400	--	<0.0600	3.70	0.190	0.420
ALKCO3	<5.00	<5.00	--	<5.00	<5.00	7.00	9.00
ALKHCO3	101.	100.	--	87.2	107.	137.	137.
ALKOH	<5.00	<5.00	--	<5.00	<5.00	<5.00	<5.00
AS	<0.0010	0.0020	--	<0.0010	0.0020	--	<0.0010
B	2.20	2.30	--	0.400	0.400	2.00	0.960
BA	<0.0500	<0.0500	--	<0.0500	<0.0500	--	<0.0500
BE	--	--	--	--	--	--	--
BR	--	4.90	--	0.940	0.840	--	1.80
CA	180.	171.	--	55.0	71.0	107.	103.
CD	<0.0002	<0.0002	--	<0.0002	0.0002	--	<0.0002
CL	767.	730.	--	140.	121.	402.	416.
CO	--	--	--	--	--	--	--
COND	336.	333.	--	82.0	81.0	191.	199.
CR	<0.0200	<0.0200	--	<0.0200	<0.0200	0.0300	0.0300
CR(VI)	<0.0100	<0.0100	--	<0.0050	<0.0050	<0.0050	--
CU	<0.0050	<0.0050	--	<0.0050	0.0200	0.0250	0.0280
FE	0.0300	0.520	--	<0.0200	14.0	0.0300	0.440
HARD	597.	574.	--	203.	281.	402.	380.
HG	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	--
I	--	<0.200	--	<0.300	<0.300	--	<0.200
K	38.0	38.0	--	10.0	12.0	17.0	17.0
MG	36.0	36.0	--	16.0	23.0	33.0	30.0
MN	<0.0100	0.0200	--	0.0200	0.290	--	0.0400
MO	0.950	1.00	--	0.0800	0.0800	--	0.150
NA	431.	431.	--	80.0	83.0	280.	264.
NI	<0.0100	<0.0100	--	<0.0100	<0.0100	--	0.0400
NO3	6.14	5.85	--	8.62	9.02	8.40	8.70
PB	<0.0050	<0.0050	--	<0.0002	0.0150	--	<0.0050
PH	8.50	8.42	--	8.19	7.73	8.44	8.36
SE	0.0035	0.0035	--	<0.0020	<0.0020	--	0.0032
SIO2	2.10	4.50	--	2.93	95.0	0.620	0.860
SO4	596.	590.	--	126.	123.	251.	249.
SR	4.35	4.95	--	1.10	1.00	2.20	2.00
TDS105	2160	2190	--	142.	397.	1320	1280
TI	<0.0500	<0.0500	--	<0.0500	<0.0500	--	<0.0500
TOC/DOC	5.90	4.95	--	9.73	6.64	4.10	3.70
TSS105	--	17.0	--	--	596.	--	22.0
U	--	<0.0300	--	<0.0500	<0.0500	--	<0.0300
V	<0.0500	<0.0200	--	<0.0500	<0.0500	--	<0.0200
ZN	<0.0100	0.0100	--	0.0100	0.130	0.0300	0.0400

* Unfiltered sample dated one day after actual sampling.

Table B3

Chemical Characteristics of Canada Brick Quarry Surface Water

Location DSC

Date	800507	811130	820314	820324	820813	820827	820924	830921	830922*
AG	--	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
AL	--	--	--	--	<3.00	<0.200	<0.500	<0.500	<0.500
ALKCO3	--	--	<5.00	--	17.0	<5.00	13.0	15.0	27.0
ALKHCO3	--	--	36.0	--	92.0	66.0	121	121	110
ALKOH	--	--	<5.00	--	<5.00	<5.00	<5.00	<5.00	<5.00
AS	--	--	--	--	<0.0010	<0.0020	<0.0020	0.0010	0.0010
B	--	--	--	--	2.50	<0.500	<1.00	2.05	2.06
BA	--	--	--	--	<40.0	1.00	1.30	<2.00	<2.00
BE	--	--	--	--	<0.0002	<0.0002	<0.0002	--	--
BR	--	--	--	--	14.0	0.300	0.200	12.0	10.0
CA	--	--	15.0	--	262	44.0	70.0	214	208
CD	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CL	--	--	26.0	--	1580	38.0	165	1200	1030
CO	--	--	--	--	--	--	<0.0500	--	--
COND	--	--	20.0	--	560	42.0	105	450	450
CR	--	--	--	--	<0.0500	0.0060	<0.0500	<0.100	<0.100
CR(VI)	--	--	--	--	0.0050	--	--	<0.0100	<0.0100
CU	--	--	--	--	0.0070	0.0070	0.0050	0.0040	0.0040
FE	--	--	--	--	<0.0500	<0.0500	<0.100	<0.0500	0.360
HARD	--	--	49.0	--	881	146	250	742	717
HG	--	--	--	--	<0.0002	0.0002	<0.0002	<0.0002	<0.0002
I	--	--	--	--	<1.00	<0.0500	<0.0500	<0.0200	<0.0200
K	--	--	3.90	--	38.0	4.20	9.50	35.0	35.0
MG	--	--	2.70	--	55.0	8.80	18.0	48.0	48.0
MN	--	--	--	--	<0.0200	<0.0200	<0.0200	<0.0500	0.0400
MO	--	--	--	--	<0.500	<0.500	<0.500	<0.500	<0.500
NA	--	--	14.0	--	835	2.70	98.0	640	640
NI	--	--	--	--	0.0120	<0.0050	0.0050	<0.0050	<0.0050
NO3	--	--	--	--	13.0	21.0	8.00	11.0	9.73
PB	--	--	--	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PH	--	--	7.20	--	8.10	7.90	8.20	8.20	8.20
SE	--	--	--	--	0.0220	<0.0020	<0.0020	0.0030	0.0030
SIO2	--	--	--	--	2.30	2.40	6.40	4.88	4.36
SO4	--	--	14.0	--	450	61.0	110	330	320
SR	--	--	--	--	5.50	0.200	0.590	2.85	2.85
TDS105	--	--	--	--	3410	262	590	2800	2860
YI	--	--	--	--	<10.0	<1.00	<1.00	<1.00	<1.00
TOC/DOC	--	--	--	--	10.0	9.00	16.0	7.00	7.00
TSS105	--	--	--	--	--	--	53.0	11.0	11.0
U	--	--	--	--	<0.300	<0.0200	<0.0010	<0.0500	<0.0500
V	--	--	--	--	<0.100	0.0030	<0.500	<0.0200	<0.0200
ZN	--	--	--	--	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B3 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location DSC

Date	831017	831018*	840217	840218*	840930	841001*	850702	850703*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0013	0.0020
AL	<0.500	13.0	0.500	10.0	<0.500	2.80	<1.00	<1.00
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
ALKHCO3	75.0	91.0	40.0	52.0	104	108	137	138
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0040	<0.0010	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	<0.0010
B	0.180	0.190	0.0600	0.0600	0.160	0.230	3.19	3.19
BA	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<7.00	<5.00
BE	--	--	--	--	--	--	--	--
BR	0.150	0.190	<0.100	<0.100	0.700	0.300	13.0	12.0
CA	33.0	38.0	22.1	35.0	51.1	41.5	267	263
CD	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
CL	40.0	39.0	64.9	68.1	140	133	1340	1470
CO	--	--	--	--	--	--	--	--
COND	37.6	37.8	36.0	38.0	74.0	74.0	500	500
CR	<0.100	<0.100	<0.0500	<0.0500	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0030	0.0140	0.0030	0.0190	0.0040	0.0080	0.0100	0.0040
FE	0.110	20.0	0.0600	17.5	<0.100	1.57	<0.0500	0.0950
HARD	111	184	74.0	164	180	159	892	891
HG	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	0.0007	0.0002	0.0002
I	<0.0050	<0.0050	<0.0500	<0.0500	<0.0600	0.350	<0.200	<0.100
K	5.90	8.10	3.40	9.70	6.96	8.18	43.2	39.8
MG	7.20	13.0	4.60	11.1	12.9	13.7	54.9	57.0
MN	<0.0500	0.420	0.0700	0.490	<0.0500	<0.0500	<0.0500	<0.0500
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.45	1.45
NA	28.0	28.0	39.0	37.0	78.9	61.9	712	719
NI	<0.0050	0.0120	<0.0050	0.0100	<0.0050	<0.0050	<0.0100	<0.0100
NO3	1.20	2.13	3.87	4.88	0.180	0.130	--	85.1
PB	0.0020	0.0160	<0.0020	0.0110	<0.0020	<0.0020	<0.0050	<0.0050
PH	8.10	7.80	7.40	7.60	7.80	7.70	8.30	8.30
SE	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0030	0.0030
SIO2	4.24	4.00	2.94	103	2.70	11.5	3.41	3.56
SO4	40.0	41.0	20.1	19.5	54.0	53.4	788	880
SR	0.220	0.280	0.120	0.170	0.500	0.970	6.01	6.01
TDS105	240	250	228	246	466	462	3310	3270
TI	<1.00	<1.00	<1.00	<1.00	<1.00	1.30	<1.00	<1.00
TOC/DOC	12.0	13.0	12.2	12.7	24.0	26.0	23.5	22.0
TSS105	--	24.0	--	630	--	--	--	24.1
U	<0.0500	<0.0500	<0.0100	<0.0100	<0.0500	<0.0500	<0.100	<0.100
V	<0.0050	0.0180	<0.0050	0.0700	<0.0100	<0.0100	<0.100	<0.0500
ZN	<0.0200	0.0700	<0.0200	0.0500	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B3 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location DSC

Date	851005	851006*	860618	860619*	861008	861009*	870403	870404*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002
AL	<1.00	2.90	<1.00	2.70	<1.00	8.00	<1.00	5.40
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
ALKHCO3	91.0	92.0	186	188	130.	130.	135.	142.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0020	0.0030	<0.0010	<0.0010	<0.0010	0.0030	<0.0010	0.0017
B	0.230	0.290	0.270	0.290	1.15	1.16	0.200	0.230
BA	<0.500	<0.500	<0.500	<0.500	<8.00	<8.00	<15.0	<15.0
BE	--	--	--	--	--	--	--	--
BR	<0.100	0.400	0.500	0.600	1.30	1.10	<5.00	<10.0
CA	42.9	43.9	73.5	75.0	84.0	90.0	67.0	77.0
CD	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	0.0002
CL	54.8	56.6	217	213	162.	160.	222.	233.
CO	--	--	--	--	--	--	--	--
COND	48.5	48.5	123	123	113.	115.	112.	112.
CR	<0.100	0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0030	0.0060	0.0140	0.0140	0.0080	0.0360	0.0040	0.0140
FE	0.0500	2.49	<0.0500	2.00	<0.0500	11.0	<0.100	11.0
HARD	146	152	270	280	286.	312.	249.	286.
HG	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	0.0002
I	<0.0500	<0.0700	<0.100	<0.300	<0.200	<0.200	<0.500	<0.500
K	5.98	6.25	6.10	7.20	16.0	17.0	5.70	6.30
MG	9.46	10.5	21.2	22.5	18.5	21.5	20.0	23.0
MN	<0.0500	0.0500	<0.0500	<0.0500	<0.0500	0.210	0.0500	0.220
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
NA	42.7	39.7	129	132	114.	114.	124.	123.
NI	<0.0050	0.0060	<0.0050	0.0050	<0.0050	0.0300	<0.0050	0.0050
NO3	3.49	3.96	2.71	2.71	3.61	3.83	4.74	4.94
PB	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020
PH	7.60	7.40	8.30	8.10	8.40	8.20	8.32	8.11
SE	0.0020	0.0040	<0.0010	<0.0010	0.0060	0.0110	0.0013	<0.0010
SIO2	1.10	11.7	2.35	--	4.40	4.95	5.05	22.4
SO4	57.2	57.3	85.0	78.0	224.	230.	102.	105.
SR	0.290	0.430	0.720	0.780	1.45	1.37	0.710	0.730
TDS105	266	283	600	630	694.	656.	703.	735.
TI	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	9.00	11.0	23.0	28.0	7.00	7.00	7.50	8.30
TSS105	--	11.0	--	--	--	626.	--	--
U	<0.0500	<0.0200	0.0200	<0.0200	<0.0600	<0.0600	<0.200	<0.200
V	<1.00	<1.00	<0.0100	<0.0200	<0.0100	0.0700	<0.0500	0.0700
ZN	<0.0200	0.0200	<0.0200	<0.0200	<0.0200	0.0200	<0.0200	0.0400

* Unfiltered sample dated one day after actual sampling.

Table B3 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location DSC

Date	870625	870626*	871008	871009*	880425	880831	880901*	881027	881028*
AG	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0001	<0.0001	<0.0002	<0.0002
AL	<1.00	<1.00	<1.00	<1.00	--	<0.0600	<0.0600	<0.0600	0.230
ALKCO3	<5.00	<5.00	<5.00	<5.00	--	<5.00	<5.00	<5.00	<5.00
ALKHCO3	175.	172.	101.	100.	--	215.	215.	214.	205.
ALKOH	<5.00	<5.00	<5.00	<5.00	--	<5.00	<5.00	<5.00	<5.00
AS	<0.0010	<0.0010	<0.0010	<0.0010	--	<0.0010	<0.0010	0.0020	0.0010
B	0.450	0.450	3.66	3.68	--	0.800	0.900	0.690	1.06
BA	<2.00	<2.00	<5.00	3.00	--	<3.00	3.70	0.0500	0.0500
BE	--	--	--	--	--	--	--	--	--
BR	0.500	<0.500	4.70	5.00	--	2.80	2.90	0.500	0.500
CA	91.0	92.0	183.	170.	--	143.	112.	88.0	94.0
CD	<0.0001	<0.0001	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0002	<0.0002
CL	239.	227.	455.	455.	--	430.	430.	244.	247.
CO	--	--	--	--	--	--	--	--	--
COND	142.	144.	284.	284.	--	199.	208.	146.	142.
CR	<0.100	<0.100	<0.100	<0.100	--	<0.0200	<0.0200	<0.0200	<0.0200
CR(VI)	--	<0.0050	<0.0050	<0.0050	--	<0.0100	<0.0100	<0.0020	0.0280
CU	0.0040	0.0050	0.0030	0.0030	--	<0.0050	<0.0050	<0.0050	<0.0050
FE	<0.0500	0.400	<0.0500	0.230	--	<0.0200	0.350	<0.0100	0.230
HARD	347.	352.	628.	597.	--	529.	451.	342.	366.
HG	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0001	<0.0001
I	<0.0500	0.0500	<0.200	<0.100	--	<0.500	<0.500	<0.100	<0.100
K	17.0	17.0	38.0	38.0	--	17.0	15.0	15.0	15.0
MG	30.0	30.0	42.0	42.0	--	42.0	42.0	30.0	32.0
MN	<0.0500	<0.500	<0.0500	<0.0500	--	<0.0100	0.0100	<0.0100	<0.0100
MO	<0.500	<0.500	1.00	1.00	--	<0.0300	<0.0300	<0.0500	<0.0500
NA	150.	147.	343.	348.	--	228.	224.	152.	164.
NI	<0.0050	<0.0050	<0.0050	0.0050	--	<0.0100	<0.0100	<0.0100	<0.0100
NO3	7.20	7.20	12.9	12.8	--	10.5	10.4	6.68	6.69
PB	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0020	<0.0020	<0.0020	<0.0020
PH	8.30	8.40	8.33	8.38	--	8.30	8.20	8.36	8.05
SE	<0.0010	0.0017	0.0110	0.0100	--	<0.0010	<0.0010	0.0010	<0.0010
SIO2	6.20	5.10	2.10	2.50	--	2.70	3.20	4.19	5.12
SO4	158.	149.	575.	646.	--	230.	230.	188.	198.
SR	1.60	1.69	4.40	4.40	--	2.70	2.74	2.14	2.21
TDS105	920.	910.	1990	1980	--	1300	1290	880.	896.
TI	<1.00	<1.00	<1.00	<1.00	--	<0.0500	<0.0500	<0.0500	<0.0500
TOC/DOC	6.60	6.90	<0.500	<0.500	--	2.60	2.10	2.45	2.77
TSS105	--	--	--	7.60	--	--	25.0	--	19.0
U	<0.0200	<0.0200	<0.0500	<0.0300	--	<0.0600	<0.0600	0.0300	0.0400
V	<0.0100	<0.0100	<0.0200	<0.0100	--	<0.0400	<0.0400	<0.0100	<0.0100
ZN	<0.0200	<0.200	0.0200	0.0200	--	<0.0100	0.0200	<0.0100	0.0200

* Unfiltered sample dated one day after actual sampling.

Table B3 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location DSC

Date	890425	890426*	890913**	891114	891115*	900405	900406*
AG	<0.0002	<0.0002	--	<0.0002	0.0003	--	<0.0002
AL	<0.0600	0.200	--	<0.0600	12.4	0.190	0.390
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	6.00	9.00
ALKHCO3	100.	101.	90.0	73.0	102.	138.	136.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0025	<0.0010	0.0012	0.0013	0.0032	--	<0.0010
B	2.20	2.30	4.20	0.400	0.400	2.00	0.990
BA	<0.0500	<0.0500	--	<0.0500	0.0600	--	<0.0500
BE	--	--	--	--	--	--	--
BR	--	4.90	--	0.840	0.900	--	1.80
CA	178.	170.	198.	51.0	69.0	105.	104.
CD	<0.0002	<0.0002	--	<0.0002	0.0003	--	<0.0002
CL	773.	720.	795.	121.	110.	400.	412.
CO	--	--	--	--	--	--	--
COND	332.	332.	360.	73.0	75.6	198.	200.
CR	<0.0200	<0.0200	--	<0.0200	<0.0200	0.0200	0.0200
CR(VI)	<0.0100	<0.0100	--	<0.0050	<0.0050	<0.0050	--
CU	<0.0050	<0.0050	--	0.0060	0.0300	0.0270	0.0280
FE	<0.0200	0.340	0.0800	<0.0200	32.0	0.0300	0.380
HARD	596.	572.	659.	180.	283.	402.	404.
HG	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	--
I	--	0.200	--	<0.300	<0.300	--	<0.200
K	38.0	38.0	47.0	10.0	13.0	17.0	17.0
MG	37.0	36.0	40.0	13.0	27.0	34.0	35.0
MN	<0.0100	0.0200	--	0.0100	0.520	--	0.0400
MO	1.00	1.00	--	0.100	0.0800	--	0.140
NA	431.	429.	500.	73.0	73.0	272.	133.
NI	<0.0100	<0.0100	--	<0.0100	0.0300	--	0.0300
NO3	6.00	5.90	3.23	8.08	8.38	8.30	8.70
PB	<0.0050	<0.0050	--	<0.0002	0.0150	--	<0.0050
PH	8.52	8.44	8.13	8.20	7.85	8.38	8.41
SE	0.0040	0.0045	0.0066	<0.0020	<0.0020	--	0.0034
SIO2	2.00	4.00	--	3.10	200.	0.640	0.700
SO4	593.	580.	701.	109.	112.	247.	267.
SR	4.19	4.52	5.72	<0.0500	<0.0500	2.00	2.20
TDS105	2170	2160	2410	154.	493.	1330	1300
TI	<0.0500	<0.0500	--	<0.0500	0.100	--	<0.0500
TOC/DOC	5.60	5.20	--	9.25	7.59	4.00	4.00
TSS105	--	11.0	5.00	--	1200	--	24.0
U	--	<0.0300	--	<0.0500	<0.0500	--	<0.0300
V	<0.0500	<0.0200	--	<0.0500	<0.0500	--	<0.0200
ZN	<0.0100	<0.0100	--	0.0200	0.160	0.0300	0.0400

* Unfiltered sample dated one day after actual sampling.

** Unfiltered sample dated day of sampling.

Table B4

Chemical Characteristics of Canada Brick Quarry Surface Water

Location PSB

Date	800507	811130	820314	820324	820813	820827	820924	830921	830922*
AG	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
AL	--	<0.200	--	<0.200	<0.600	<0.200	<0.500	<0.500	<0.500
ALKCO3	--	--	--	<5.00	19.0	<5.00	9.00	22.0	27.0
ALKHCO3	--	110	--	86.0	160	65.0	133	127	122
ALKOH	--	--	--	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	--	0.0010	--	<0.0010	<0.0010	<0.0020	<0.0020	0.0010	0.0010
B	--	<0.500	--	<1.00	<0.500	<0.500	<1.00	1.66	1.71
BA	--	<1.00	--	<2.00	<8.00	1.00	1.40	<2.00	<2.00
BE	--	--	--	--	<0.0002	<0.0002	<0.0002	--	--
BR	--	0.100	--	<0.200	1.60	0.300	0.600	11.0	10.0
CA	--	58.0	--	34.0	97.0	43.0	70.0	220	223
CD	--	0.0010	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
CL	--	46.0	--	50.0	242	38.0	165	1100	1060
CO	--	--	--	--	--	--	<0.0500	--	--
COND	--	48.0	--	39.0	141	41.0	79.0	420	420
CR	--	<0.100	--	<0.0500	<0.0500	0.0040	<0.0500	<0.100	<0.100
CR(VI)	--	0.0050	--	0.0070	0.0040	--	--	<0.0100	<0.0100
CU	--	0.0030	--	0.0050	0.0130	0.0120	0.0070	0.0050	0.0040
FE	--	<0.0500	--	0.0500	<0.0500	<0.0500	<0.100	<0.0500	0.230
HARD	--	211	--	120	333	143	250	759	770
HG	--	--	--	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002
I	--	<0.0100	--	<0.0200	<0.200	<0.0500	<0.0500	<0.0200	<0.0200
K	--	5.80	--	4.70	11.0	4.20	6.20	29.0	29.0
MG	--	16.0	--	8.10	22.0	8.70	18.0	51.0	52.0
MN	--	<0.0200	--	<0.100	<0.0200	<0.0200	<0.0200	<0.0500	<0.0500
MO	--	<0.500	--	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
NA	--	26.0	--	30.0	173	2.70	55.0	570	570
NI	--	<0.0050	--	<0.0050	<0.0050	<0.0050	0.0100	<0.0050	<0.0050
NO3	--	0.500	--	0.100	3.00	20.0	8.00	7.90	7.68
PB	--	0.0090	--	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
PH	--	8.10	--	7.90	8.30	7.90	8.00	8.30	8.20
SE	--	<0.0010	--	<0.0010	0.0040	<0.0020	<0.0020	0.0020	0.0020
SIO2	--	15.0	--	2.60	3.70	4.10	6.20	5.62	5.09
SO4	--	74.0	--	24.0	175	59.0	140	310	290
SR	--	0.130	--	0.140	1.12	0.200	0.400	2.50	2.50
TDS105	--	370	--	236	848	242	490	2700	2730
TI	--	<0.500	--	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	--	--	--	14.0	17.0	10.0	16.0	5.00	2.00
TSS105	--	48.0	--	--	--	--	34.0	7.00	7.00
U	--	<0.0100	--	<0.0100	<0.0600	<0.0200	<0.0010	<0.0500	<0.0500
V	--	<0.0050	--	<0.0100	<0.0200	<0.0030	<0.500	<0.0200	<0.0200
ZN	--	<0.0200	--	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B4 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location PSB

Date	831017	831018*	840217	840218*	840930	841001*	850702	850703*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
AL	<0.500	13.0	<0.500	12.0	<0.500	1.80	<1.00	<1.00
ALKCO3	<5.00	<5.00	<5.00	<5.00	12.0	<5.00	<5.00	<5.00
ALKHCO3	72.0	87.0	40.0	55.0	129	140	160	161
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0030	<0.0010	<0.0010	0.0030	<0.0010	<0.0010	<0.0010	<0.0010
B	0.200	0.150	0.0700	0.0600	0.330	0.350	2.45	2.44
BA	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<6.00	<5.00
BE	--	--	--	--	--	--	--	--
BR	0.210	<0.0500	<0.100	<0.100	0.900	0.600	10.0	9.00
CA	30.0	38.0	22.6	41.0	63.5	66.5	239	236
CD	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0003
CL	36.0	35.0	65.4	66.7	140	138	1070	1080
CO	--	--	--	--	--	--	--	--
COND	35.0	35.2	36.0	38.0	86.0	86.0	440	440
CR	<0.100	<0.100	<0.0500	<0.0500	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0030	0.0140	0.0030	0.0230	0.0040	0.0060	0.0100	0.0060
FE	0.380	20.0	0.0600	21.6	<0.100	1.08	<0.0500	0.395
HARD	93.0	184	75.0	194	223	235	805	804
HG	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	0.0006	0.0003	<0.0002
I	<0.0050	<0.0050	<0.0500	<0.0500	<0.0600	<0.0600	<0.200	<0.100
K	5.90	7.90	3.50	8.70	9.21	10.3	34.1	31.8
MG	6.70	13.0	4.60	13.0	15.8	16.7	50.9	52.3
MN	<0.0500	0.400	0.0800	0.650	<0.0050	<0.0500	<0.0500	<0.0500
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	1.00	1.00
NA	27.0	28.0	40.0	38.0	87.4	86.6	605	615
NI	<0.0050	0.0120	<0.0050	0.0100	<0.0050	<0.0050	<0.0100	<0.0100
NO3	1.78	2.00	3.94	5.01	0.180	0.130	--	70.0
PB	0.0020	0.0170	<0.0020	0.0230	<0.0020	<0.0020	<0.0050	<0.0050
PH	8.00	7.80	7.50	7.60	8.00	7.80	8.30	8.20
SE	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	0.0020
SIO2	3.66	3.66	3.39	126	5.30	8.30	1.55	3.86
SO4	38.0	37.0	18.6	19.5	74.0	81.0	599	608
SR	0.220	0.270	0.120	0.200	1.07	1.00	5.00	5.00
TDS105	220	230	228	250	520	516	2830	2790
TI	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	13.0	12.0	11.5	10.6	25.0	27.0	21.0	26.0
TSS105	--	75.0	--	920	--	--	--	1.60
U	<0.0500	<0.0500	<0.0100	<0.0100	<0.0500	<0.0500	<0.100	<0.100
V	<0.0050	0.0110	<0.0050	0.0800	<0.0100	<0.0100	<0.100	<0.0500
ZN	<0.0200	0.0700	<0.0200	0.100	<0.0200	<0.0200	<0.0200	<0.0200

* Unfiltered sample dated one day after actual sampling.

Table B4 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location PSB

Date	851005	851006*	860618	860619*	861008	861009*	870403	870404*
AG	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0002	<0.0002
AL	<1.00	2.70	<1.00	3.90	<1.00	2.60	<1.00	3.20
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
ALKHCO3	90.0	107	203	205	133.	132.	139.	141.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	0.0010	0.0030	<0.0010	<0.0010	<0.0010	0.0020	0.0010	0.0021
B	0.220	0.250	0.270	0.320	0.950	0.980	0.190	0.240
BA	<0.500	<0.500	<0.500	<0.500	<8.00	<8.00	<15.0	<15.0
BE	--	--	--	--	--	--	--	--
BR	0.100	0.200	0.500	0.800	1.60	1.30	<5.00	<10.0
CA	50.3	52.6	80.0	82.0	80.0	80.0	69.0	75.0
CD	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	0.0002
CL	62.3	63.1	217	214	142.	150.	222.	240.
CO	--	--	--	--	--	--	--	--
COND	54.5	55.0	124	125	105.	108.	114.	118.
CR	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
CR(VI)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0050	<0.0050
CU	0.0050	0.0060	0.0120	0.0140	0.0070	0.0230	0.0040	0.0100
FE	0.100	2.56	<0.0500	3.00	<0.0500	4.50	<0.100	6.50
HARD	170	6.73	293	305	272.	278.	254.	277.
HG	<0.0002	0.0006	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	0.0003
I	<0.0500	<0.0500	<0.100	<0.300	<0.200	<0.200	<0.500	<0.500
K	6.31	181	7.30	8.70	14.0	14.0	5.90	6.30
MG	10.9	12.2	22.7	24.2	17.5	19.0	20.0	22.0
MN	<0.0500	0.0500	<0.0500	0.0700	<0.0500	0.0900	<0.0500	0.140
MO	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
NA	45.1	44.2	134	135	100.	104.	126.	130.
NI	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0110	<0.0050	0.0050
NO3	4.38	4.24	5.81	6.14	4.56	4.44	6.20	6.40
PB	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020
PH	7.50	7.60	8.20	8.10	8.30	8.10	8.34	8.11
SE	0.0030	0.0020	<0.0010	0.0020	0.0050	0.0040	0.0010	0.0010
SIO2	0.270	3.77	5.80	6.85	4.45	4.75	4.25	18.3
SO4	64.2	64.3	105	95.0	186.	193.	96.0	98.0
SR	0.170	0.190	0.950	0.940	1.29	1.61	0.760	0.750
TDS105	326	304	590	680	624.	656.	693.	743.
TI	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
TOC/DOC	11.0	12.0	26.0	28.0	8.00	6.00	8.20	8.10
TSS105	--	5.00	--	--	--	260.	--	--
U	<0.0500	0.0300	0.0200	0.0400	<0.0600	<0.0600	<0.200	<0.200
V	<1.00	<1.00	<0.0100	<0.0200	<0.0100	0.0200	<0.0500	<0.0500
ZN	<0.0200	0.0200	0.0400	0.190	<0.0200	0.140	<0.0200	0.0200

* Unfiltered sample dated one day after actual sampling.

Table B4 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location PSB

Date	870625	870626*	871008	871009*	880425	880831	880901*	881027	881028*
AG	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0001	<0.0001	<0.0002	<0.0002
AL	<1.00	<1.00	<1.00	<1.00	--	<0.0600	<0.0600	<0.0600	1.37
ALKCO3	<5.00	<5.00	<5.00	<5.00	--	<5.00	<5.00	<5.00	<5.00
ALKHCO3	212.	208.	200.	200.	--	243.	245.	218.	224.
ALKOH	<5.00	<5.00	<5.00	<5.00	--	<5.00	<5.00	<5.00	<5.00
AS	<0.0010	<0.0010	<0.0010	<0.0010	--	<0.0010	<0.0010	0.0020	0.0020
B	0.450	0.470	1.27	1.28	--	0.800	0.800	0.680	0.680
BA	<2.00	<2.00	<5.00	<3.00	--	<3.00	<3.00	0.0500	0.0500
BE	--	--	--	--	--	--	--	--	--
BR	0.600	0.500	3.30	3.00	--	2.10	2.20	0.600	0.500
CA	100.	98.0	126.	117.	--	130.	118.	85.0	91.0
CD	<0.0001	<0.0001	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0002	<0.0002
CL	228.	223.	397.	397.	--	405.	400.	251.	244.
CO	--	--	--	--	--	--	--	--	--
COND	145.	143.	214.	214.	--	195.	198.	150.	145.
CR	<0.100	<0.100	<0.100	<0.100	--	<0.0200	<0.0200	<0.0200	<0.0200
CR(VI)	--	<0.0050	<0.0050	<0.0050	--	<0.0100	<0.0100	0.0300	0.418
CU	0.0040	0.0040	0.0030	0.0030	--	<0.0050	<0.0050	<0.0050	<0.0050
FE	<0.0500	0.270	<0.0500	0.300	--	<0.0200	0.100	<0.0200	2.24
HARD	373.	371.	499.	477.	--	492.	462.	323.	349.
HG	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0001	<0.0001	<0.0001	<0.0001
I	<0.0500	0.0600	<0.200	<0.100	--	<0.500	<0.500	<0.100	<0.100
K	17.0	17.0	18.0	18.0	--	18.0	18.0	30.0	30.0
MG	30.0	30.0	45.0	45.0	--	41.0	41.0	27.0	29.7
MN	<0.0500	<0.500	<0.0500	<0.0500	--	<0.0100	<0.0100	<0.0100	0.0500
MO	<0.500	<0.500	<0.500	<0.500	--	<0.0300	<0.0300	<0.0500	<0.0500
NA	146.	143.	242.	240.	--	226.	215.	181.	171.
NI	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0100	<0.0100	<0.0100	<0.0100
NO3	9.10	9.10	7.84	7.85	--	11.8	11.7	9.12	8.56
PB	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0020	<0.0020	<0.0020	<0.0020
PH	8.30	8.30	8.39	8.34	--	8.20	8.20	8.22	7.84
SE	<0.0010	<0.0010	0.0050	0.0030	--	<0.0010	<0.0010	0.0010	<0.0010
SIO2	6.50	6.15	4.00	4.30	--	5.20	5.50	6.73	1.99
SO4	142.	145.	268.	237.	--	230.	260.	196.	190.
SR	2.00	2.00	2.60	2.70	--	2.70	2.97	1.95	2.12
TDS105	918.	912.	1390	1400	--	1260	1260	936.	960.
TI	<1.00	<1.00	<1.00	<1.00	--	<0.0500	<0.0500	<0.0500	<0.0500
TOC/DOC	6.00	6.50	3.60	3.40	--	2.30	2.20	3.88	3.46
TSS105	--	--	--	11.2	--	--	3.00	--	139.
U	<0.0200	<0.0200	0.0500	<0.0300	--	<0.0600	<0.0600	<0.0200	0.0300
V	<0.0100	<0.0100	<0.0200	<0.0100	--	<0.0400	<0.0400	<0.0100	0.0300
ZN	<0.0200	<0.200	0.0200	0.0200	--	<0.0100	0.0100	<0.0100	0.0300

* Unfiltered sample dated one day after actual sampling.

Table B4 (Cont)

Chemical Characteristics of Canada Brick Quarry Surface Water

Location PSB

Date	890425	890426*	890913	891114	891115*	900405	900406*
AG	<0.0002	<0.0002	--	<0.0002	0.0003	--	<0.0002
AL	0.0600	0.200	--	0.300	3.00	0.180	0.290
ALKCO3	<5.00	<5.00	--	<5.00	<5.00	7.00	<5.00
ALKHCO3	127.	119.	--	86.0	104.	150.	156.
ALKOH	<5.00	<5.00	--	<5.00	<5.00	<5.00	<5.00
AS	0.0025	<0.0010	--	<0.0010	0.0023	--	<0.0010
B	1.90	2.00	--	0.400	0.400	1.90	0.850
BA	<0.0500	<0.0500	--	<0.0500	<0.0500	--	<0.0500
BE	--	--	--	--	--	--	--
BR	--	4.30	--	0.920	0.770	--	1.60
CA	174.	172.	--	56.0	68.0	110.	105.
CD	<0.0002	<0.0002	--	<0.0002	0.0002	--	<0.0002
CL	687.	710.	--	133.	119.	407.	418.
CO	--	--	--	--	--	--	--
COND	321.	325.	--	81.0	82.5	197.	205.
CR	<0.0200	<0.0200	--	<0.0200	<0.0200	0.0200	0.0300
CR(VI)	<0.0100	<0.0100	--	<0.0050	<0.0050	<0.0050	--
CU	<0.0050	<0.0050	--	0.0080	0.0200	0.0250	0.0260
FE	<0.0200	0.190	--	<0.0200	19.0	0.0300	0.250
HARD	594.	585.	--	202.	268.	418.	406.
HG	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	--
I	--	<0.200	--	<0.300	<0.300	--	<0.200
K	34.0	34.0	--	11.0	12.0	16.5	17.0
MG	39.0	38.0	--	15.0	24.0	35.0	35.0
MN	<0.0100	0.0200	--	0.0100	0.340	--	0.0300
MO	0.880	1.00	--	0.100	0.0800	--	0.120
NA	412.	411.	--	79.0	78.0	274.	248.
NI	<0.0100	<0.0100	--	<0.0100	<0.0100	--	0.0300
NO3	7.09	6.58	--	8.33	8.62	9.20	9.60
PB	<0.0050	<0.0050	--	<0.0002	0.0130	--	<0.0050
PH	8.32	8.25	--	8.14	7.80	8.33	8.18
SE	0.0040	0.0030	--	<0.0020	<0.0020	--	0.0026
SIO2	2.60	4.40	--	3.00	127.	0.710	0.930
SO4	506.	510.	--	117.	118.	237.	254.
SR	3.91	4.23	--	<0.0500	<0.0500	2.20	2.30
TDS105	2070	2080	--	250.	257.	1350	1260
TI	<0.0500	<0.0500	--	<0.0500	4.50	--	<0.0500
TOC/DOC	6.00	5.60	--	8.54	6.37	4.10	3.80
TSS105	--	4.00	--	--	516.	--	9.00
U	--	<0.0300	--	<0.0500	<0.0500	--	<0.0300
V	<0.0500	<0.0200	--	<0.0500	<0.0500	--	<0.0200
ZN	0.0100	0.0100	--	0.0100	0.130	0.0300	0.0400

* Unfiltered sample dated one day after actual sampling.

Table 85

Chemical Characteristics of Canada Brick Quarry Surface Water

Date 13 September 1989

Location	CPO	POND	OCC	DSC
Date	890913**	890913**	890913**	890913**
AG	--	--	--	--
AL	--	--	--	--
ALKCO3	<5.00	<5.00	<5.00	<5.00
ALKHCO3	256.	58.0	61.0	90.0
ALKOH	<5.00	<5.00	<5.00	<5.00
AS	<0.0010	0.0020	0.0025	0.0012
B	1.00	5.10	5.60	4.20
BA	--	--	--	--
BE	--	--	--	--
BR	--	--	--	--
CA	133.	200.	228.	198.
CD	--	--	--	--
CL	454.	918.	921.	795.
CO	--	--	--	--
COND	222.	402.	420.	360.
CR	--	--	--	--
CR(VI)	--	--	--	--
CU	--	--	--	--
FE	0.470	0.120	0.120	0.0800
HARD	558.	668.	729.	659.
HG	--	--	--	--
I	--	--	--	--
K	22.0	52.0	56.0	47.0
MG	55.0	41.0	39.0	40.0
MN	--	--	--	--
NO	--	--	--	--
NA	243.	595.	610.	500.
NI	--	--	--	--
NO3	11.5	2.16	1.93	3.23
PB	--	--	--	--
PH	7.84	7.95	7.87	8.13
SE	0.0102	0.0066	0.0024	0.0066
SIO2	--	--	--	--
SO4	219.	788.	853.	701.
SR	3.00	6.50	7.08	5.72
TDS105	1420	2750	2890	2410
TI	--	--	--	--
TOC/DOC	--	--	--	--
TSS105	22.0	6.00	8.00	5.00
U	--	--	--	--
V	--	--	--	--
ZN	--	--	--	--

** Unfiltered sample dated day of sampling.

Table B6

Chemical Characteristics of Canada Brick Quarry Surface Water

Date 5 April 1990

Location	POND	POND	SPD	SPD	HPD	HPD	SUMP	OCC	OCC
Date	900405	900406*	900405	900406*	900405	900406*	900406*	900405	900406*
AG	--	<0.0002	--	<0.0002	--	<0.0002	<0.0002	--	<0.0002
AL	0.180	0.590	0.190	0.400	0.150	0.470	0.210	0.190	0.380
ALKCO3	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	15.0	<5.00	<5.00
ALKHCO3	114.	114.	104.	104.	115.	115.	28.0	115.	115.
ALKOH	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00
AS	--	0.0011	--	<0.0010	--	<0.0010	0.0300	--	<0.0010
B	1.50	1.87	2.00	0.640	2.00	0.690	1.22	1.40	1.79
BA	--	<0.0500	--	<0.0500	--	<0.0500	<0.0500	--	<0.0500
BE	--	--	--	--	--	--	--	--	--
BR	--	2.80	--	0.900	--	0.300	3.60	--	3.00
CA	101.	103.	83.0	83.0	97.0	99.0	200.	99.0	99.0
CD	--	<0.0002	--	<0.0002	--	<0.0002	<0.0002	--	<0.0002
CL	278.	280.	140.	137.	245.	247.	348.	265.	274.
CO	--	--	--	--	--	--	--	--	--
COND	175.	173.	119.	118.	136.	135.	244.	170.	171.
CR	0.0200	0.0200	0.0200	0.0200	0.0200	0.0300	0.0200	0.0200	0.0200
CR(VI)	<0.0050	--	<0.0050	--	<0.0050	--	--	<0.0050	--
CU	0.0250	0.0270	0.0260	0.0260	0.0250	0.0270	0.0240	0.0260	0.0260
FE	0.0300	0.850	0.0400	0.440	0.0200	0.510	0.0600	0.0400	0.420
HARD	355.	368.	339.	339.	415.	420.	577.	354.	358.
HG	<0.0001	--	<0.0001	--	<0.0001	--	--	<0.0001	--
I	--	<0.200	--	<0.200	--	<0.200	<0.200	--	<0.200
K	20.0	20.0	17.0	16.0	16.0	19.0	44.0	20.0	19.0
MG	25.0	27.0	32.0	32.0	42.0	42.0	19.0	26.0	27.0
MN	--	0.0400	--	0.0500	--	0.0300	0.0400	--	0.0300
MO	--	0.360	--	<0.0500	--	<0.0500	0.290	--	0.330
NA	242.	220.	122.	126.	117.	118.	316.	236.	240.
NI	--	0.0300	--	0.0400	--	0.0400	0.0300	--	0.0200
NO3	8.40	8.70	13.8	14.5	1.40	1.30	21.9	8.30	8.60
PB	--	<0.0050	--	<0.0050	--	<0.0050	<0.0050	--	<0.0050
PH	8.19	8.05	8.14	7.90	8.21	8.00	8.70	8.23	8.05
SE	--	0.0075	--	0.0047	--	0.0011	0.0100	--	0.0071
SIO2	0.560	1.36	0.900	1.26	0.120	0.440	0.540	0.540	0.890
SO4	334.	351.	271.	278.	188.	200.	709.	323.	336.
SR	2.80	2.60	2.00	2.00	2.50	2.50	2.50	2.40	2.70
TDS105	1200	1210	850.	862.	1040	989.	1820	1180	1190
TI	--	<0.0500	--	<0.0500	--	<0.0500	<0.0500	--	<0.0500
TOC/DOC	1.50	<0.300	2.30	2.70	2.90	3.30	<0.300	1.60	<0.300
TSS105	--	37.0	--	23.0	--	23.0	9.00	--	24.0
U	--	<0.0300	--	<0.0300	--	<0.0300	<0.0300	--	<0.0300
V	--	<0.0200	--	<0.0200	--	<0.0200	<0.0200	--	<0.0200
ZN	0.0300	0.0300	0.0700	0.0800	0.0300	0.0400	0.0300	0.0300	0.0400

* Unfiltered sample dated one day after actual sampling.

APPENDIX C

CANADA BRICK SURFACE WATER SURVEY

ION BALANCES AND PIPER DIAGRAMS

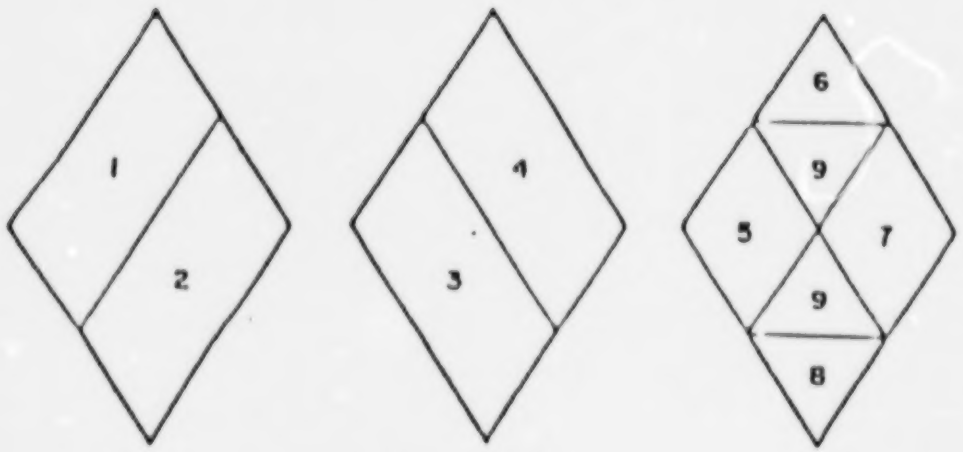
1989-1990

EPM = equivalents per million
(milliequivalents per litre)

Locations:		
	CPO	Canadian Pacific Overpass
	SPF	South Property Fence
	DSC	Dundas Street Culvert
	PSB	Paisley Street Bridge
	POND	Clean Water Pond
	SPD	SUMP Pond
	HPD	High Pond
	SUMP	SUMP
	OCC	Old Creek Course

Figure C1

Guide to Piper Interpretation



Water types on a trilinear diagram:

area 1 – $(Ca^{+2} + Mg^{+2}) > (Na^{+} + K^{+})$;

area 2 – $(Ca^{+2} + Mg^{+2}) < (Na^{+} + K^{+})$;

area 3 – $(HCO_3^{-} + CO_3^{-2}) > (Cl^{-} + SO_4^{-2})$;

area 4 – $(HCO_3^{-} + CO_3^{-2}) < (Cl^{-} + SO_4^{-2})$;

area 5 – carbonate hardness (secondary alkalinity) > 50%;

area 6 – noncarbonate hardness (secondary salinity) > 50%;

area 7 – noncarbonate alkali (primary salinity) > 50%;

area 8 – carbonate alkali (primary alkalinity) > 50%;

area 9 – no dominant cation-anion pair.

Table C1

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location CPO

Cations

Date	Number	Calcium			Magnesium			Sodium			Potassium			Total Ions (EPM)		
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Cation	Anion	
800507	1	81.00	4.04	45.86	24.40	2.01	22.78	60.00	2.61	29.61	6.00	0.15	1.74	8.81	9.58	
811130	2	57.00	2.84	55.16	16.00	1.32	25.53	20.00	0.87	16.87	4.90	0.13	2.43	5.16	4.78	
820314	3	15.00	0.75	42.37	2.70	0.22	12.58	16.00	0.70	39.40	3.90	0.10	5.65	1.77	1.74	
820324	4	34.00	1.70	46.30	8.30	0.68	18.64	27.00	1.17	32.05	4.30	0.11	3.00	3.66	3.95	
820813	5	116.00	5.79	44.84	34.00	2.80	21.68	97.00	4.22	32.69	4.00	0.10	0.79	12.91	13.19	
820827	6	43.00	2.15	62.27	8.40	0.69	20.06	12.00	0.52	15.15	3.40	0.09	2.52	3.45	2.92	
820924	7	72.00	3.59	53.80	18.00	1.48	22.18	34.00	1.48	22.15	4.90	0.13	1.88	6.68	7.31	
830921	8	89.00	4.44	47.46	22.00	1.81	19.35	71.00	3.09	33.01	0.66	0.02	0.18	9.36	9.14	
830922	9	88.00	4.39	46.77	23.00	1.89	20.16	71.00	3.09	32.89	0.67	0.02	0.18	9.39	9.40	
831017	10	29.00	1.45	52.86	5.70	0.47	17.13	16.00	0.70	25.42	4.90	0.13	4.58	2.74	2.58	
831018	11	31.00	1.55	50.79	7.80	0.64	21.07	16.00	0.70	22.85	6.30	0.16	5.29	3.05	2.64	
840217	12	21.40	1.07	35.32	4.30	0.35	11.70	35.00	1.52	50.35	3.10	0.08	2.62	3.02	2.83	
840218	13	26.90	1.34	37.31	7.70	0.63	17.61	33.00	1.44	39.89	7.30	0.19	5.19	3.60	3.15	
840930	14	34.70	1.73	39.67	12.20	1.00	23.00	34.60	1.51	34.48	4.87	0.12	2.85	4.37	5.75	*
841001	15	46.10	2.30	41.46	12.50	1.03	18.54	47.80	2.08	37.47	5.49	0.14	2.53	5.55	5.72	
850702	16	130.00	6.49	27.61	40.70	3.35	14.26	310.00	13.48	57.40	6.75	0.17	0.73	23.49	25.53	
850703	17	129.00	6.44	27.27	41.20	3.39	14.36	313.00	13.61	57.67	6.48	0.17	0.70	23.61	23.43	
851005	18	39.10	1.95	48.05	8.93	0.73	18.10	28.90	1.26	30.96	4.61	0.12	2.90	4.06	4.17	
851006	19	40.90	2.04	47.89	9.96	0.82	19.23	29.30	1.27	29.91	4.95	0.13	2.97	4.26	3.77	
860618	20	74.00	3.69	36.30	21.70	1.79	17.55	105.00	4.57	44.89	5.00	0.13	1.26	10.17	10.60	
860619	21	88.00	4.39	37.27	32.50	2.67	22.70	104.00	4.52	38.40	7.50	0.19	1.63	11.78	10.63	
861008	22	69.00	3.44	42.33	19.50	1.60	19.73	67.00	2.91	35.83	6.70	0.17	2.11	8.13	8.19	
861009	23	138.00	6.89	51.89	38.00	3.13	23.56	69.00	3.00	22.62	10.00	0.26	1.93	13.27	8.92	*
870403	24	69.00	3.44	33.13	20.00	1.65	15.84	119.00	5.18	49.80	5.00	0.13	1.23	10.39	11.01	
870404	25	72.00	3.59	33.40	21.00	1.73	16.06	122.00	5.31	49.33	5.10	0.13	1.21	10.76	11.59	
870625	26	100.00	4.99	34.75	35.00	2.88	20.05	141.00	6.13	42.71	14.00	0.36	2.49	14.36	13.67	
870626	27	100.00	4.99	34.65	36.00	2.96	20.57	140.00	6.09	42.29	14.00	0.36	2.49	14.40	13.39	
871008	28	105.00	5.24	26.46	48.00	3.95	19.95	234.00	10.18	51.40	17.00	0.43	2.20	19.80	20.81	
871009	29	107.00	5.34	26.17	52.00	4.28	20.97	238.00	10.35	50.73	17.00	0.43	2.13	20.41	20.82	
880425	30	162.00	8.08	29.99	60.00	4.94	18.31	311.00	13.53	50.18	16.00	0.41	1.52	26.96	27.58	
880831	31	173.00	8.63	39.61	48.00	3.95	18.12	203.00	8.83	40.51	15.00	0.38	1.76	21.80	22.74	
880901	32	150.00	7.49	35.78	48.00	3.95	18.88	208.00	9.05	43.25	17.00	0.43	2.08	20.92	22.55	
881027	33	102.00	5.09	37.07	33.00	2.72	19.78	128.00	5.57	40.55	14.00	0.36	2.61	13.73	14.16	
881028	34	101.00	5.04	35.70	33.00	2.72	19.24	138.00	6.00	42.52	14.00	0.36	2.54	14.12	13.86	
890425	35	106.00	5.29	28.59	36.00	2.96	16.01	228.00	9.92	53.60	13.00	0.33	1.80	18.50	19.92	
890426	36	106.00	5.29	28.48	36.00	2.96	15.95	229.00	9.96	53.64	14.00	0.36	1.93	18.57	20.17	
890913	37	133.00	6.64	29.77	55.00	4.53	20.30	243.00	10.57	47.41	22.00	0.56	2.52	22.30	22.48	
891114	38	34.00	1.70	41.87	10.00	0.82	20.31	32.00	1.39	34.35	5.50	0.14	3.47	4.05	4.01	
891115	39	59.00	2.94	43.10	27.00	2.22	32.52	33.00	1.44	21.01	9.00	0.23	3.37	6.83	4.11	*
900405	40	128.00	6.39	26.79	46.00	3.79	15.88	306.00	13.31	55.83	14.00	0.36	1.50	23.84	21.59	
900406	41	134.00	6.69	27.39	49.00	4.03	16.52	306.00	13.31	54.52	15.00	0.38	1.57	24.41	21.75	

* Indicates that cations and anions do not lie within 10% of mean

Table C1 (cont)

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location CPO

Anions

Date	Number	Chloride			Sulphate			Bicarbonate as CaCO3			Carbonate as CaCO3			Total Ions (EPM)	
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Anion	Cation
800507	1	136.00	3.84	40.04	81.00	1.69	17.60	201.00	4.02	41.94	2.00	0.04	0.42	9.58	8.81
811130	2	40.00	1.13	23.58	70.00	1.46	30.46	110.00	2.20	45.96	<5.00	0.00	0.00	4.78	5.16
820314	3	26.00	0.73	42.04	14.00	0.29	16.71	36.00	0.72	41.25	<5.00	0.00	0.00	1.74	1.77
820324	4	60.00	1.69	42.81	26.00	0.54	13.69	86.00	1.72	43.49	<5.00	0.00	0.00	3.95	3.66
820813	5	177.00	4.99	37.86	140.00	2.91	22.11	240.00	4.80	36.39	24.00	0.48	3.64	13.19	12.91
820827	6	22.00	0.62	21.25	49.00	1.02	34.94	64.00	1.28	43.81	<5.00	0.00	0.00	2.92	3.45
820924	7	85.00	2.40	32.78	95.00	1.98	27.04	137.00	2.74	37.45	10.00	0.20	2.73	7.31	6.68
830921	8	120.00	3.38	37.03	95.00	1.98	21.64	163.00	3.26	35.65	26.00	0.52	5.69	9.14	9.36
830922	9	130.00	3.67	39.00	94.00	1.96	20.81	165.00	3.30	35.08	24.00	0.48	5.10	9.40	9.39
831017	10	24.00	0.68	26.23	30.00	0.62	24.20	64.00	1.28	49.57	<5.00	0.00	0.00	2.58	2.74
831018	11	24.00	0.68	25.64	29.00	0.60	22.87	68.00	1.36	51.49	<5.00	0.00	0.00	2.64	3.05
840217	12	61.50	1.73	61.20	17.30	0.36	12.71	37.00	0.74	26.10	<5.00	0.00	0.00	2.83	3.02
840218	13	66.10	1.86	59.28	18.30	0.38	12.11	45.00	0.90	28.60	<5.00	0.00	0.00	3.15	3.60
840930	14	99.00	2.79	48.58	44.00	0.92	15.94	95.00	1.90	33.04	7.00	0.14	2.43	5.75	4.37 *
841001	15	98.00	2.76	48.34	43.00	0.90	15.66	103.00	2.06	36.01	<5.00	0.00	0.00	5.72	5.55
850702	16	639.00	18.02	70.61	151.00	3.14	12.32	218.00	4.36	17.07	<5.00	0.00	0.00	25.53	23.49
850703	17	572.00	16.13	68.87	140.00	2.91	12.44	219.00	4.38	18.69	<5.00	0.00	0.00	23.43	23.61
851005	18	43.60	1.23	29.49	38.50	0.80	19.22	107.00	2.14	51.29	<5.00	0.00	0.00	4.17	4.06
851006	19	42.20	1.19	31.54	37.70	0.78	20.80	90.00	1.80	47.67	<5.00	0.00	0.00	3.77	4.26
860618	20	193.00	5.44	51.37	67.00	1.39	13.16	188.00	3.76	35.47	<5.00	0.00	0.00	10.60	10.17
860619	21	192.00	5.42	50.94	70.00	1.46	13.71	188.00	3.76	35.35	<5.00	0.00	0.00	10.63	11.78
861008	22	118.00	3.33	40.63	78.00	1.62	19.83	162.00	3.24	39.54	<5.00	0.00	0.00	8.19	8.13
861009	23	120.00	3.38	37.97	112.00	2.33	26.16	160.00	3.20	35.88	<5.00	0.00	0.00	8.92	13.27 *
870403	24	220.00	6.21	56.38	99.00	2.06	18.73	137.00	2.74	24.89	<5.00	0.00	0.00	11.01	10.39
870404	25	240.00	6.77	58.41	99.00	2.06	17.78	138.00	2.76	23.80	<5.00	0.00	0.00	11.59	10.76
870625	26	233.00	6.57	48.07	149.00	3.10	22.69	200.00	4.00	29.24	<5.00	0.00	0.00	13.67	14.36
870626	27	231.00	6.52	48.66	141.00	2.94	21.92	197.00	3.94	29.41	<5.00	0.00	0.00	13.39	14.40
871008	28	432.00	12.19	58.55	203.00	4.23	20.31	220.00	4.40	21.14	<5.00	0.00	0.00	20.81	19.80
871009	29	432.00	12.19	58.52	194.00	4.04	19.40	230.00	4.60	22.08	<5.00	0.00	0.00	20.82	20.41
880425	30	600.00	16.92	61.35	247.00	5.14	18.64	276.00	5.52	20.00	<5.00	0.00	0.00	27.58	26.96
880831	31	430.00	12.13	53.35	230.00	4.79	21.06	291.00	5.82	25.59	<5.00	0.00	0.00	22.74	21.80
880901	32	430.00	12.13	53.79	220.00	4.58	20.32	292.00	5.84	25.89	<5.00	0.00	0.00	22.55	20.92
881027	33	212.00	5.98	42.24	169.00	3.52	24.86	233.00	4.66	32.90	<5.00	0.00	0.00	14.16	13.73
881028	34	201.00	5.67	40.89	166.00	3.46	24.93	237.00	4.74	34.18	<5.00	0.00	0.00	13.86	14.12
890425	35	394.00	11.11	55.80	248.00	5.16	25.93	182.00	3.64	18.27	<5.00	0.00	0.00	19.92	18.50
890426	36	460.00	12.97	64.32	170.00	3.54	17.55	183.00	3.66	18.14	<5.00	0.00	0.00	20.17	18.57
890913	37	454.00	12.81	56.96	219.00	4.56	20.28	256.00	5.12	22.76	<5.00	0.00	0.00	22.48	22.30
891114	38	65.00	1.83	45.76	53.50	1.11	27.80	53.00	1.06	26.44	<5.00	0.00	0.00	4.01	4.05
891115	39	46.00	1.30	31.59	54.20	1.13	27.47	84.10	1.68	40.94	<5.00	0.00	0.00	4.11	6.83 *
900405	40	475.00	13.40	62.06	187.00	3.89	18.03	207.00	4.14	19.17	8.00	0.16	0.74	21.59	23.84
900406	41	477.00	13.45	61.85	195.00	4.06	18.66	212.00	4.24	19.48	<5.00	0.00	0.00	21.75	24.41

* Indicates that cations and anions do not lie within 10% of mean

Figure C2

MAJOR ION CHEMISTRY
PIPER DIAGRAM
CANADA BRICK CPO

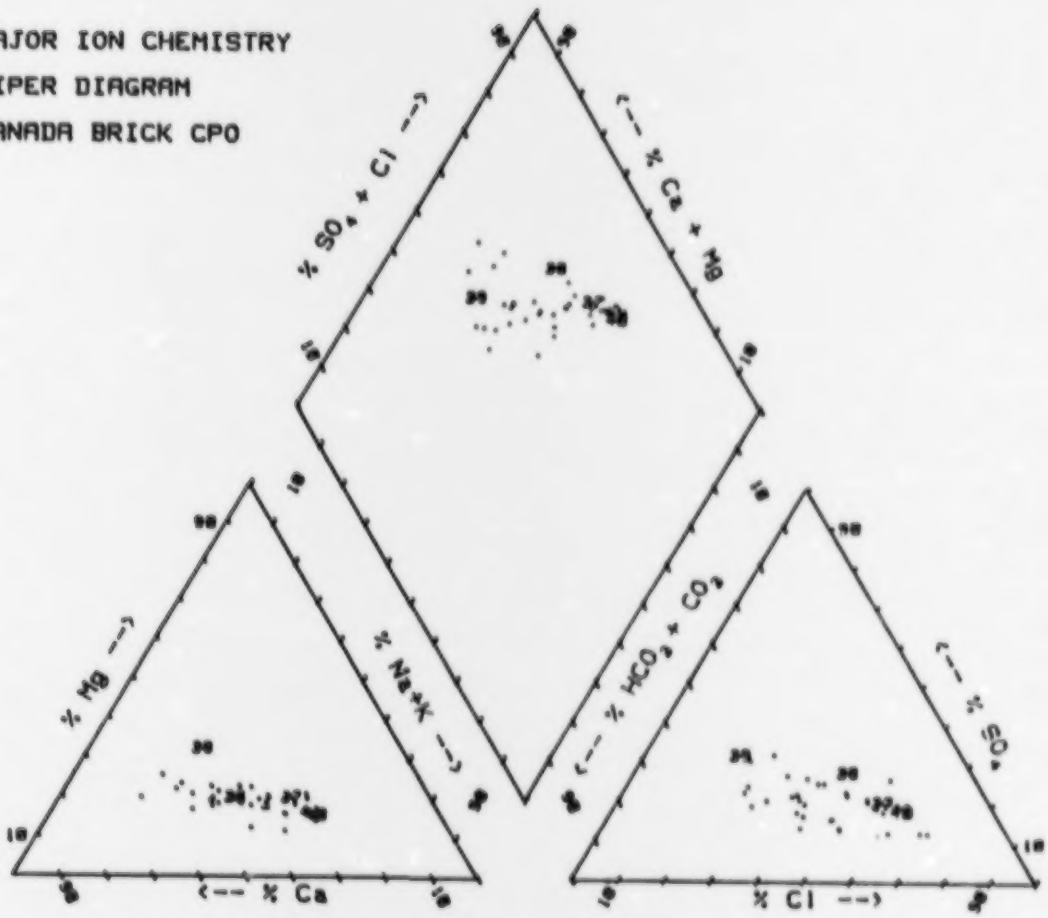


Table C2

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location SPf

Cations

Date	Number	Calcium			Magnesium			Sodium			Potassium			Total Ions (EPM)		
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Cation	Anion	
800507	1	79.00	3.94	45.84	22.80	1.88	21.82	61.00	2.65	30.85	5.00	0.13	1.49	8.60	8.98	
811130	2	57.00	2.84	52.38	16.00	1.32	24.25	26.00	1.13	20.83	5.40	0.14	2.54	5.43	4.88	
820314	3	17.00	0.85	41.41	3.30	0.27	13.26	19.00	0.83	40.34	4.00	0.10	4.99	2.05	2.05	
820324	4	33.00	1.65	45.13	8.10	0.67	18.27	28.00	1.22	33.38	4.60	0.12	3.22	3.65	3.69	
820813	5	259.00	12.92	22.44	54.00	4.44	7.72	900.00	39.15	67.98	42.00	1.07	1.87	57.59	59.58	
820827	6	45.00	2.25	70.52	8.60	0.71	22.22	2.90	0.13	3.96	4.10	0.10	3.29	3.18	3.73	
820924	7	72.00	3.59	36.32	18.00	1.48	14.97	105.00	4.57	46.17	9.80	0.25	2.53	9.89	11.74	
830921	8	207.00	10.33	24.35	46.00	3.79	8.92	630.00	27.40	64.61	35.00	0.90	2.11	42.41	43.34	
830922	9	208.00	10.38	24.15	47.00	3.87	9.00	640.00	27.84	64.77	35.00	0.90	2.08	42.98	41.38	
831017	10	29.00	1.45	44.09	6.10	0.50	15.29	27.00	1.17	35.78	6.20	0.16	4.83	3.28	3.12	
831018	11	40.00	2.00	39.51	20.00	1.65	32.58	27.00	1.17	23.25	9.20	0.24	4.66	5.05	3.62	*
840217	12	22.00	1.10	32.05	4.50	0.37	10.81	43.00	1.87	54.60	3.40	0.09	2.54	3.43	3.01	
840218	13	35.00	1.75	39.80	10.50	0.86	19.69	36.00	1.57	35.68	8.30	0.21	4.84	4.39	3.29	*
840930	14	35.70	1.78	38.32	7.50	0.62	13.27	49.40	2.15	46.22	3.98	0.10	2.19	4.65	6.63	*
841001	15	49.90	2.49	38.31	9.60	0.79	12.16	70.80	3.08	47.39	5.45	0.14	2.14	6.50	6.34	
850702	16	261.00	13.02	26.06	55.90	4.60	9.20	720.00	31.32	62.67	40.40	1.03	2.07	49.98	58.78	
850703	17	264.00	13.17	26.03	58.60	4.82	9.53	725.00	31.54	62.30	42.50	1.09	2.15	50.62	54.66	
851005	18	41.40	2.07	43.50	9.19	0.76	15.92	40.80	1.77	37.37	5.95	0.15	3.20	4.75	4.42	
851006	19	42.50	2.12	44.32	10.20	0.84	17.54	38.30	1.67	34.82	6.21	0.16	3.32	4.78	4.41	
860618	20	72.70	3.63	32.46	21.20	1.74	15.61	130.00	5.65	50.59	5.87	0.15	1.34	11.18	11.57	
860619	21	75.00	3.74	32.53	23.20	1.91	16.59	130.00	5.65	49.15	7.80	0.20	1.73	11.51	11.53	
861008	22	86.00	4.29	38.53	18.50	1.52	13.67	113.00	4.92	44.13	16.00	0.41	3.67	11.14	11.96	
861009	23	86.00	4.29	37.60	21.00	1.73	15.14	114.00	4.96	43.45	17.00	0.43	3.81	11.41	11.99	
870403	24	68.00	3.39	31.55	20.00	1.65	15.30	128.00	5.57	51.77	5.80	0.15	1.38	10.76	11.08	
870404	25	71.00	3.54	31.86	22.00	1.81	16.28	129.00	5.61	50.46	6.10	0.16	1.40	11.12	11.81	
870625	26	90.00	4.49	31.94	31.00	2.55	18.14	152.00	6.61	47.02	16.00	0.41	2.91	14.06	13.60	
870626	27	91.00	4.54	32.58	31.00	2.55	18.30	148.00	6.44	46.19	16.00	0.41	2.94	13.94	13.02	
871008	28	190.00	9.48	32.29	38.00	3.13	10.65	361.00	15.70	53.48	41.00	1.05	3.57	29.36	38.06	*
871009	29	183.00	9.13	30.75	39.00	3.21	10.81	375.00	16.31	54.92	41.00	1.05	3.53	29.70	32.46	
880425	30	147.00	7.34	26.03	58.00	4.77	16.93	359.00	15.62	55.41	18.00	0.46	1.63	28.18	28.97	
880831	31	145.00	7.24	33.90	43.00	3.54	16.58	233.00	10.13	47.48	17.00	0.43	2.04	21.34	21.32	
880901	32	105.00	5.24	27.87	43.00	3.54	18.82	221.00	9.61	51.13	16.00	0.41	2.18	18.80	21.32	
881027	33	88.00	4.39	31.89	30.00	2.47	17.93	150.00	6.52	47.39	15.00	0.38	2.79	13.77	14.99	
881028	34	97.00	4.84	31.84	33.00	2.72	17.86	167.00	7.26	47.78	15.00	0.38	2.52	15.20	14.70	
890425	35	180.00	8.98	28.37	36.00	2.96	9.36	431.00	18.75	59.21	38.00	0.97	3.07	31.66	36.06	
890426	36	171.00	8.53	27.34	36.00	2.96	9.49	431.00	18.75	60.06	38.00	0.97	3.11	31.21	34.87	
891114	37	55.00	2.74	35.20	16.00	1.32	16.89	80.00	3.48	44.63	10.00	0.26	3.28	7.80	8.32	
891115	38	71.00	3.54	37.88	23.00	1.89	20.24	83.00	3.61	38.60	12.00	0.31	3.28	9.35	8.11	
900405	39	107.00	5.34	25.83	33.00	2.72	13.14	280.00	12.18	58.93	17.00	0.43	2.10	20.67	19.44	
900406	40	103.00	5.14	26.32	30.00	2.47	12.64	264.00	11.48	58.81	17.00	0.43	2.23	19.53	19.84	

* Indicates that cations and anions do not lie within 10% of mean

Table C2 (cont)

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location SPF

Anions

Date	Number	Chloride			Sulphate			Bicarbonate as CaCO3			Carbonate as CaCO3			Total Ions (EPM)		
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Anion	Cation	
800507	1	122.00	3.44	38.34	78.00	1.62	18.09	190.00	3.80	42.32	5.60	0.11	1.25	8.98	8.60	
811130	2	42.00	1.18	24.26	72.00	1.50	30.70	110.00	2.20	45.04	0.00	0.00	0.00	4.88	5.43	
820314	3	34.00	0.96	46.78	14.00	0.29	14.22	40.00	0.80	39.01	<5.00	0.00	0.00	2.05	2.05	
820324	4	55.00	1.55	42.05	23.00	0.48	12.98	83.00	1.66	44.97	<5.00	0.00	0.00	3.69	3.65	
820813	5	1700.00	47.95	80.48	450.00	9.37	15.73	99.00	1.98	3.32	14.00	0.28	0.47	59.58	57.59	
820827	6	41.00	1.16	31.02	63.00	1.31	35.19	63.00	1.26	33.79	<5.00	0.00	0.00	3.73	3.18	
820924	7	215.00	6.06	51.65	145.00	3.02	25.71	120.00	2.40	20.43	13.00	0.26	2.21	11.74	9.89	
830921	8	1200.00	33.85	78.10	330.00	6.87	15.85	117.00	2.34	5.40	14.00	0.28	0.65	43.34	42.41	
830922	9	1130.00	31.87	77.02	330.00	6.87	16.60	107.00	2.14	5.17	25.00	0.50	1.21	41.38	42.98	
831017	10	35.00	0.99	31.66	38.00	0.79	25.38	67.00	1.34	42.96	<5.00	0.00	0.00	3.12	3.28	
831018	11	35.00	0.99	27.30	36.00	0.75	20.73	94.00	1.88	51.97	<5.00	0.00	0.00	3.62	5.05	*
840217	12	65.40	1.84	61.29	18.50	0.39	12.80	39.00	0.78	25.91	<5.00	0.00	0.00	3.01	3.43	
840218	13	66.60	1.88	57.16	19.60	0.41	12.42	50.00	1.00	30.42	<5.00	0.00	0.00	3.29	4.39	*
840930	14	125.00	3.53	53.21	50.00	1.04	15.71	94.00	1.88	28.36	9.00	0.18	2.72	6.63	4.65	*
841001	15	118.00	3.33	52.52	45.60	0.95	14.98	103.00	2.06	32.49	<5.00	0.00	0.00	6.34	6.30	
850702	16	1420.00	40.05	68.14	768.00	15.99	27.20	137.00	2.74	4.66	<5.00	0.00	0.00	58.78	49.98	
850703	17	1310.00	36.95	67.60	718.00	14.95	27.35	138.00	2.76	5.05	<5.00	0.00	0.00	54.66	50.62	
851005	18	51.10	1.44	32.64	58.40	1.22	27.53	88.00	1.76	39.83	<5.00	0.00	0.00	4.42	4.75	
851006	19	51.50	1.45	32.96	55.50	1.16	26.22	90.00	1.80	40.82	<5.00	0.00	0.00	4.41	4.78	
860618	20	215.00	6.06	52.40	85.00	1.77	15.29	187.00	3.74	32.30	<5.00	0.00	0.00	11.57	11.18	
860619	21	210.00	5.92	51.36	88.00	1.83	15.89	189.00	3.78	32.76	<5.00	0.00	0.00	11.53	11.51	
861008	22	162.00	4.57	38.22	229.00	4.77	39.88	131.00	2.62	21.90	<5.00	0.00	0.00	11.96	11.14	
861009	23	164.00	4.63	38.57	228.00	4.75	39.59	131.00	2.62	21.84	<5.00	0.00	0.00	11.99	11.41	
870403	24	222.00	6.26	56.49	102.00	2.12	19.16	135.00	2.70	24.35	<5.00	0.00	0.00	11.08	10.76	
870404	25	244.00	6.88	58.29	104.00	2.17	18.34	138.00	2.76	23.37	<5.00	0.00	0.00	11.81	11.12	
870625	26	245.00	6.91	50.83	154.00	3.21	23.58	174.00	3.48	25.59	<5.00	0.00	0.00	13.60	14.06	
870626	27	232.00	6.54	50.25	147.00	3.06	23.50	171.00	3.42	26.25	<5.00	0.00	0.00	13.02	13.94	
871008	28	610.00	17.21	45.21	919.00	19.13	50.27	86.00	1.72	4.52	<5.00	0.00	0.00	38.06	29.36	*
871009	29	610.00	17.21	53.01	646.00	13.45	41.44	80.10	1.60	4.93	9.90	0.20	0.61	32.46	29.70	
880425	30	689.00	19.43	67.07	246.00	5.12	17.68	221.00	4.42	15.25	<5.00	0.00	0.00	28.97	28.18	
880831	31	430.00	12.13	56.90	230.00	4.79	22.47	220.00	4.40	20.63	<5.00	0.00	0.00	21.32	21.34	
880901	32	430.00	12.13	56.90	230.00	4.79	22.47	220.00	4.40	20.63	<5.00	0.00	0.00	21.32	18.80	
881027	33	243.00	6.85	45.74	187.00	3.89	25.98	212.00	4.24	28.28	<5.00	0.00	0.00	14.99	13.77	
881028	34	237.00	6.68	45.49	187.00	3.89	26.49	206.00	4.12	28.02	<5.00	0.00	0.00	14.70	15.20	
890425	35	767.00	21.63	59.99	596.00	12.41	34.41	101.00	2.02	5.60	<5.00	0.00	0.00	36.06	31.66	
890426	36	730.00	20.59	59.04	590.00	12.28	35.22	100.00	2.00	5.73	<5.00	0.00	0.00	34.87	31.21	
891114	37	140.00	3.95	47.49	126.00	2.62	31.55	87.20	1.74	20.96	<5.00	0.00	0.00	8.32	7.80	
891115	38	121.00	3.41	42.07	123.00	2.56	31.57	107.00	2.14	26.37	<5.00	0.00	0.00	8.11	9.35	
900405	39	402.00	11.34	58.32	251.00	5.23	26.88	137.00	2.74	14.09	7.00	0.14	0.72	19.44	20.67	
900406	40	416.00	11.73	59.15	249.00	5.18	26.13	137.00	2.74	13.81	9.00	0.18	0.91	19.84	19.53	

* Indicates that cations and anions do not lie within 10% of mean

MAJOR ION CHEMISTRY
PIPER DIAGRAM
CANADA BRICK SPF

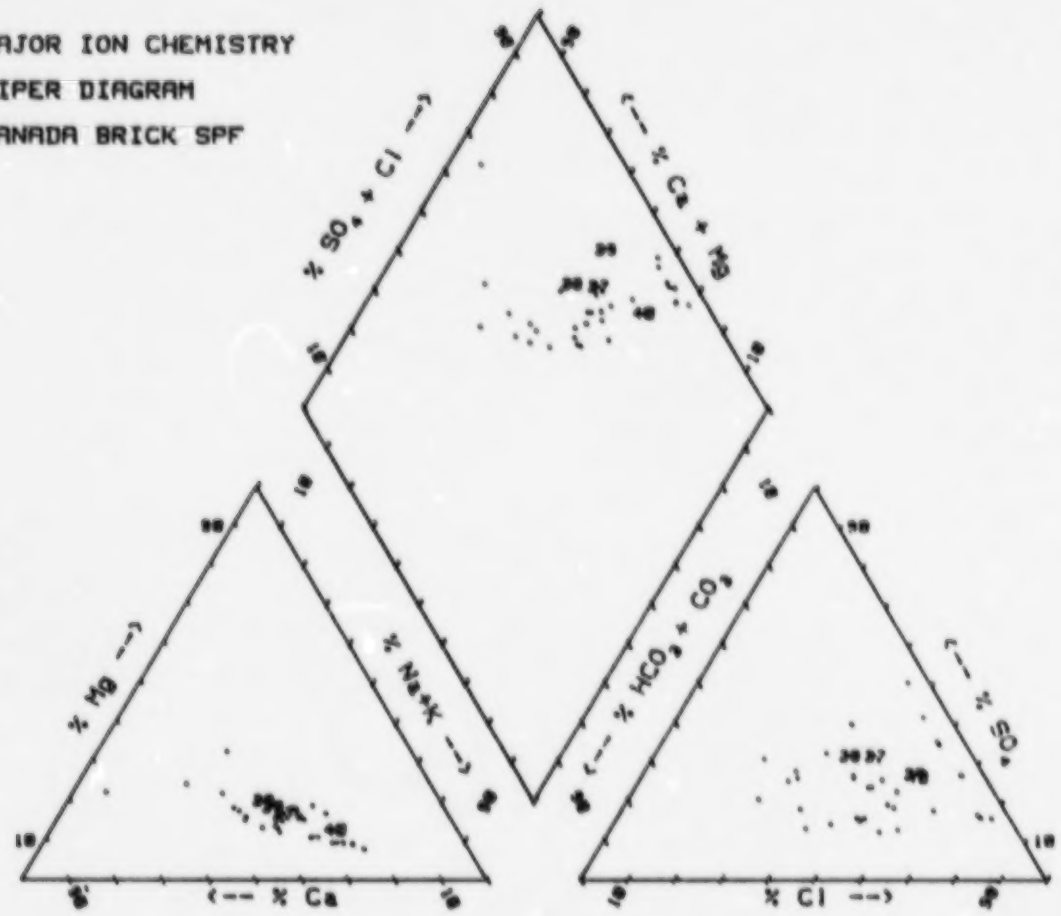


Table C3

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location DSC

Cations

Date	Number	Calcium			Magnesium			Sodium			Potassium			Total Ions (EPM)		
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Cation	Anion	
820314	1	15.00	0.75	0.45	2.70	0.22	13.25	14.00	0.61	36.26	3.90	0.10	5.94	1.68	1.74	
820813	2	262.00	13.07	0.24	55.00	4.53	8.24	835.00	36.32	66.17	38.00	0.97	1.77	54.89	55.97	
820827	3	44.00	2.20	0.70	8.80	0.72	23.03	2.70	0.12	3.73	4.20	0.11	3.42	3.14	3.66	
820924	4	70.00	3.49	0.37	18.00	1.48	15.62	98.00	4.26	44.97	9.50	0.24	2.56	9.48	9.62	
830921	5	214.00	10.68	0.25	48.00	3.95	9.11	640.00	27.84	64.20	35.00	0.90	2.06	43.36	43.44	
830922	6	208.00	10.38	0.24	48.00	3.95	9.17	640.00	27.84	64.65	35.00	0.90	2.08	43.06	38.45	
831017	7	33.00	1.65	0.46	7.20	0.59	16.42	28.00	1.22	33.76	5.90	0.15	4.18	3.61	3.46	
831018	8	38.00	1.90	0.43	13.00	1.07	24.36	28.00	1.22	27.74	8.10	0.21	4.72	4.39	3.77	
840217	9	22.10	1.10	0.34	4.60	0.38	11.59	39.00	1.70	51.96	3.40	0.09	2.66	3.26	3.05	
840218	10	35.00	1.75	0.39	11.10	0.91	20.22	37.00	1.61	35.63	9.70	0.25	5.49	4.52	3.37	*
840930	11	51.10	2.55	0.35	12.90	1.06	14.70	78.90	3.43	47.52	6.96	0.18	2.47	7.22	7.15	
841001	12	41.50	2.07	0.34	13.70	1.13	18.48	61.90	2.69	44.14	8.18	0.21	3.43	6.10	7.02	
850702	13	267.00	13.32	0.27	54.90	4.52	9.05	712.00	30.97	62.04	43.20	1.10	2.21	49.92	56.94	
850703	14	263.00	13.12	0.26	57.00	4.69	9.36	719.00	31.27	62.42	39.80	1.02	2.03	50.11	62.54	*
851005	15	42.90	2.14	0.43	9.46	0.78	15.79	42.70	1.86	37.68	5.98	0.15	3.10	4.93	4.56	
851006	16	43.90	2.19	0.44	10.50	0.86	17.49	39.70	1.73	34.95	6.25	0.16	3.24	4.94	4.63	
860618	17	73.50	3.67	0.33	21.20	1.74	15.60	129.00	5.61	50.19	6.10	0.16	1.40	11.18	11.61	
860619	18	75.00	3.74	0.32	22.50	1.85	16.07	132.00	5.74	49.84	7.20	0.18	1.60	11.52	11.39	
861008	19	84.00	4.19	37.82	18.50	1.52	13.74	114.00	4.96	44.75	16.00	0.41	3.69	11.08	11.83	
861009	20	90.00	4.49	38.54	21.50	1.77	15.18	114.00	4.96	42.55	17.00	0.43	3.73	11.65	11.90	
870403	21	67.00	3.34	31.75	20.00	1.65	15.63	124.00	5.39	51.23	5.70	0.15	1.38	10.53	11.08	
870404	22	77.00	3.84	34.17	23.00	1.89	16.83	123.00	5.35	47.57	6.30	0.16	1.43	11.25	11.60	
870625	23	91.00	4.54	32.51	30.00	2.47	17.67	150.00	6.52	46.71	17.00	0.43	3.11	13.97	13.53	
870626	24	92.00	4.59	33.06	30.00	2.47	17.77	147.00	6.39	46.04	17.00	0.43	3.13	13.89	12.94	
871008	25	183.00	9.13	32.06	42.00	3.46	12.14	343.00	14.92	52.39	38.00	0.97	3.41	28.48	26.82	
871009	26	170.00	8.48	30.24	42.00	3.46	12.32	348.00	15.14	53.97	38.00	0.97	3.47	28.05	28.28	
880831	27	143.00	7.14	34.07	42.00	3.46	16.50	228.00	9.92	47.35	17.00	0.43	2.08	20.94	21.22	
880901	28	112.00	5.59	29.15	42.00	3.46	18.03	224.00	9.74	50.82	15.00	0.38	2.00	19.17	21.22	
881027	29	88.00	4.39	31.69	30.00	2.47	17.82	152.00	6.61	47.72	15.00	0.38	2.77	13.86	15.07	
881028	30	94.00	4.69	31.61	32.00	2.63	17.74	164.00	7.13	48.07	15.00	0.38	2.59	14.84	15.19	
890425	31	178.00	8.88	28.07	37.00	3.04	9.62	431.00	18.75	59.24	38.00	0.97	3.07	31.65	36.15	
890426	32	170.00	8.48	27.30	36.00	2.96	9.53	429.00	18.66	60.04	38.00	0.97	3.13	31.08	34.40	
890913	33	198.00	9.88	27.35	40.00	3.29	9.11	500.00	21.75	60.21	47.00	1.20	3.33	36.12	38.82	
891114	34	51.00	2.54	36.12	13.00	1.07	15.18	73.00	3.18	45.07	10.00	0.26	3.63	7.05	7.14	
891115	35	69.00	3.44	37.54	27.00	2.22	24.22	73.00	3.18	34.62	13.00	0.33	3.62	9.17	7.47	*
900405	36	105.00	5.24	25.81	34.00	2.80	13.78	272.00	11.83	58.27	17.00	0.43	2.14	20.30	19.30	
900406	37	104.00	5.19	36.32	35.00	2.88	20.15	133.00	5.79	40.49	17.00	0.43	3.04	14.29	20.08	*

*Indicates that cations and anions do not lie within 10% of mean

Table C3 (cont)

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location DSC

Anions

		Chloride			Sulphate			Bicarbonate as CaCO3			Carbonate as CaCO3			Total Ions (EPM)		
Date	Number	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Anion	Cation	
820314	1	26.00	0.73	42.04	14.00	0.29	16.71	36.00	0.72	41.25	<5.00	0.00	0.00	1.74	1.68	
820813	2	1575.00	44.43	79.37	450.00	9.37	16.74	92.00	1.84	3.29	17.00	0.34	0.61	55.97	54.89	
820827	3	38.00	1.07	29.27	61.00	1.27	34.69	66.00	1.32	36.04	<5.00	0.00	0.00	3.66	3.14	
820924	4	165.00	4.65	48.36	110.00	2.29	23.80	121.00	2.42	25.14	13.00	0.26	2.70	9.62	9.48	
830921	5	1200.00	33.85	77.92	330.00	6.87	15.82	121.00	2.42	5.57	15.00	0.30	0.69	43.44	43.36	
830922	6	1030.00	29.05	75.55	320.00	6.66	17.33	110.00	2.20	5.72	27.00	0.54	1.40	38.45	43.06	
831017	7	40.00	1.13	32.60	40.00	0.83	24.07	75.00	1.50	43.33	<5.00	0.00	0.00	3.46	3.61	
831018	8	39.00	1.10	29.16	41.00	0.85	22.63	91.00	1.82	48.22	<5.00	0.00	0.00	3.77	4.39	
840217	9	64.90	1.83	60.04	20.10	0.42	13.73	40.00	0.80	26.23	<5.00	0.00	0.00	3.05	3.26	
840218	10	68.10	1.92	57.06	19.50	0.41	12.06	52.00	1.04	30.88	<5.00	0.00	0.00	3.37	4.52	*
840930	11	140.00	3.95	55.21	54.00	1.12	15.72	104.00	2.08	29.07	<5.00	0.00	0.00	7.15	7.22	
841001	12	133.00	3.75	53.42	53.40	1.11	15.83	108.00	2.16	30.75	<5.00	0.00	0.00	7.02	6.10	
850702	13	1340.00	37.80	66.38	788.00	16.41	28.81	137.00	2.74	4.81	<5.00	0.00	0.00	56.94	49.92	
850703	14	1470.00	41.46	66.29	880.00	18.32	29.29	138.00	2.76	4.41	<5.00	0.00	0.00	62.54	50.11	*
851005	15	54.80	1.55	33.93	57.20	1.19	26.14	91.00	1.82	39.93	<5.00	0.00	0.00	4.56	4.93	
851006	16	56.60	1.60	34.49	57.30	1.19	25.77	92.00	1.84	39.74	<5.00	0.00	0.00	4.63	4.94	
860618	17	217.00	6.12	52.72	85.00	1.77	15.24	186.00	3.72	32.03	<5.00	0.00	0.00	11.61	11.18	
860619	18	213.00	6.01	52.75	78.00	1.62	14.26	188.00	3.76	33.00	<5.00	0.00	0.00	11.39	11.52	
861008	19	162.00	4.57	38.62	224.00	4.66	39.42	130.00	2.60	21.97	<5.00	0.00	0.00	11.83	11.08	
861009	20	160.00	4.51	37.92	230.00	4.79	40.24	130.00	2.60	21.84	<5.00	0.00	0.00	11.90	11.65	
870403	21	222.00	6.26	56.49	102.00	2.12	19.16	135.00	2.70	24.35	<5.00	0.00	0.00	11.08	10.53	
870404	22	233.00	6.57	56.67	105.00	2.19	18.85	142.00	2.84	24.48	<5.00	0.00	0.00	11.60	11.25	
870625	23	239.00	6.74	49.83	158.00	3.29	24.31	175.00	3.50	25.86	<5.00	0.00	0.00	13.53	13.97	
870626	24	227.00	6.40	49.47	149.00	3.10	23.97	172.00	3.44	26.57	<5.00	0.00	0.00	12.94	13.89	
871008	25	455.00	12.83	47.84	575.00	11.97	44.63	101.00	2.02	7.53	<5.00	0.00	0.00	26.82	28.48	
871009	26	455.00	12.83	45.38	646.00	13.45	47.55	100.00	2.00	7.07	<5.00	0.00	0.00	28.28	28.05	
880831	27	430.00	12.13	57.17	230.00	4.79	22.57	215.00	4.30	20.26	<5.00	0.00	0.00	21.22	20.94	
880901	28	430.00	12.13	57.17	230.00	4.79	22.57	215.00	4.30	20.26	<5.00	0.00	0.00	21.22	19.17	
881027	29	244.00	6.88	45.65	188.00	3.91	25.97	214.00	4.28	28.38	<5.00	0.00	0.00	15.07	13.86	
881028	30	247.00	6.97	45.87	198.00	4.12	27.14	205.00	4.10	26.98	<5.00	0.00	0.00	15.19	14.84	
890425	31	773.00	21.80	60.32	593.00	12.35	34.15	100.00	2.00	5.53	<5.00	0.00	0.00	36.15	31.65	
890426	32	720.00	20.31	59.03	580.00	12.08	35.10	101.00	2.02	5.87	<5.00	0.00	0.00	34.40	31.08	
890913	33	795.00	22.42	57.77	701.00	14.60	37.60	90.00	1.80	4.64	<5.00	0.00	0.00	38.82	36.12	
891114	34	121.00	3.41	47.79	109.00	2.27	31.78	73.00	1.46	20.43	<5.00	0.00	0.00	7.14	7.05	
891115	35	110.00	3.10	41.51	112.00	2.33	31.20	102.00	2.04	27.28	<5.00	0.00	0.00	7.47	9.17	*
900405	36	400.00	11.28	58.45	247.00	5.14	26.64	138.00	2.76	14.29	6.00	0.12	0.62	19.30	20.30	
900406	37	412.00	11.62	57.88	267.00	5.56	27.69	136.00	2.72	13.54	9.00	0.18	0.90	20.08	14.29	*

* Indicates that cations and anions do not lie within 10% of mean

MAJOR ION CHEMISTRY
PIPER DIAGRAM
CANADA BRICK DSC

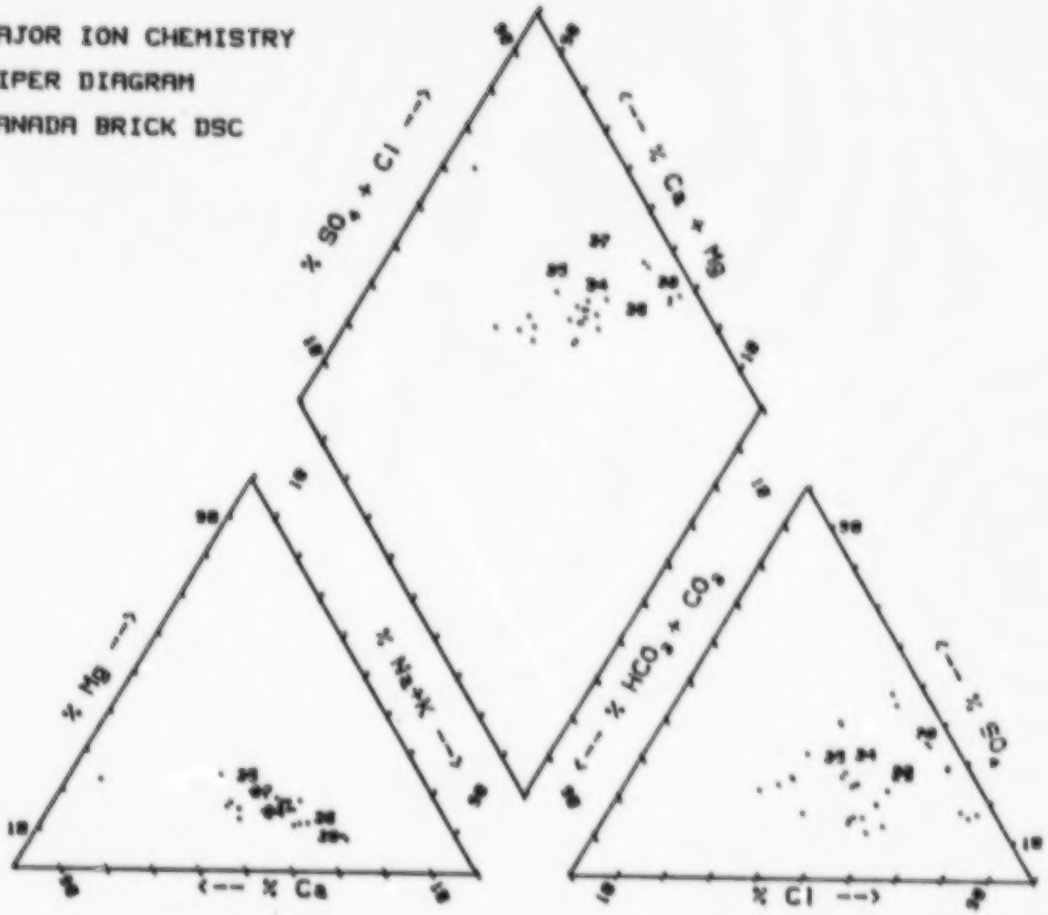


Table C4

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location PBB

Cations

Date	Number	Calcium			Magnesium			Sodium			Potassium			Total Ions (EPM)	
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Cation	Anion
811130	1	58.00	2.89	0.53	16.00	1.32	23.98	26.00	1.13	20.60	5.80	0.15	2.70	5.49	5.04
820324	2	34.00	1.70	0.45	8.10	0.67	17.59	30.00	1.30	34.45	4.70	0.12	3.17	3.79	3.63
820813	3	97.00	4.84	0.33	22.00	1.81	12.52	173.00	7.53	52.05	11.00	0.28	1.95	14.46	14.05
820827	4	43.00	2.15	0.70	8.70	0.72	23.19	2.70	0.12	3.81	4.20	0.11	3.48	3.09	3.60
820924	5	70.00	3.49	0.46	18.00	1.48	19.68	55.00	2.39	31.79	6.20	0.16	2.11	7.53	10.41 *
830921	6	220.00	10.98	0.27	51.00	4.20	10.31	570.00	24.79	60.90	29.00	0.74	1.82	40.71	40.46
830922	7	223.00	11.13	0.27	52.00	4.28	10.45	570.00	24.79	60.56	29.00	0.74	1.81	40.94	38.92
831017	8	30.00	1.50	0.44	6.70	0.55	16.34	27.00	1.17	34.81	5.90	0.15	4.47	3.37	3.25
831018	9	38.00	1.90	0.43	13.00	1.07	24.39	28.00	1.22	27.77	7.90	0.20	4.61	4.39	3.50 *
840217	10	22.60	1.13	0.34	4.60	0.38	11.35	40.00	1.74	52.16	3.50	0.09	2.68	3.34	3.03
840218	11	41.00	2.05	0.41	13.00	1.07	21.43	38.00	1.65	33.12	8.70	0.22	4.46	4.99	3.39 *
840930	12	63.50	3.17	0.37	15.80	1.30	15.28	87.40	3.80	44.69	9.21	0.24	2.77	8.51	8.31
841001	13	66.50	3.32	0.38	16.70	1.37	15.75	86.60	3.77	43.18	10.30	0.26	3.02	8.72	8.38
850702	14	239.00	11.93	0.28	50.90	4.19	9.67	605.00	26.32	60.77	34.10	0.87	2.01	43.30	45.85
850703	15	236.00	11.78	0.27	52.30	4.30	9.86	615.00	26.75	61.29	31.80	0.81	1.86	43.64	46.34
851005	16	50.30	2.51	0.45	10.90	0.90	16.22	45.10	1.96	35.47	6.31	0.16	2.92	5.53	4.89
851006	17	52.60	2.62	0.44	12.20	1.00	16.69	44.20	1.92	31.97	18.10	0.46	7.70	6.01	5.26
860618	18	80.00	3.99	0.34	22.70	1.87	15.73	134.00	5.83	49.08	7.30	0.19	1.57	11.88	12.37
860619	19	82.00	4.09	0.34	24.20	1.99	16.35	135.00	5.87	48.22	8.70	0.22	1.83	12.18	12.11
861008	20	80.00	3.99	39.37	17.50	1.44	14.20	100.00	4.35	42.90	14.00	0.36	3.53	10.14	10.54
861009	21	80.00	3.99	38.25	19.00	1.56	14.98	104.00	4.52	43.34	14.00	0.36	3.43	10.44	10.89
870403	22	69.00	3.44	32.12	20.00	1.65	15.35	126.00	5.48	51.12	5.90	0.15	1.41	10.72	11.04
870404	23	75.00	3.74	32.92	22.00	1.81	15.92	130.00	5.65	49.74	6.30	0.16	1.42	11.37	11.63
870625	24	100.00	4.99	35.03	30.00	2.47	17.33	146.00	6.35	44.58	17.00	0.43	3.05	14.24	13.63
870626	25	98.00	4.89	34.90	30.00	2.47	17.62	143.00	6.22	44.39	17.00	0.43	3.10	14.01	13.47
871008	26	126.00	6.29	29.97	45.00	3.70	17.65	242.00	10.53	50.18	18.00	0.46	2.19	20.98	20.78
871009	27	117.00	5.84	28.56	45.00	3.70	18.12	240.00	10.44	51.07	18.00	0.46	2.25	20.44	20.13
880831	28	130.00	6.49	32.19	41.00	3.37	16.74	226.00	9.83	48.78	18.00	0.46	2.28	20.15	21.07
880901	29	118.00	5.89	30.87	41.00	3.37	17.69	215.00	9.35	49.03	18.00	0.46	2.41	19.07	21.59
881027	30	85.00	4.24	28.08	27.00	2.22	14.71	181.00	7.87	52.13	30.00	0.77	5.08	15.10	15.52
881028	31	91.00	4.54	29.89	29.70	2.44	16.09	171.00	7.44	48.97	30.00	0.77	5.05	15.19	15.32
890425	32	174.00	8.68	28.30	39.00	3.21	10.46	412.00	17.92	58.41	34.00	0.87	2.83	30.68	32.45
890426	33	172.00	8.58	28.18	38.00	3.13	10.27	411.00	17.88	58.70	34.00	0.87	2.86	30.46	33.02
891114	34	56.00	2.79	36.07	15.00	1.23	15.93	79.00	3.44	44.36	11.00	0.28	3.63	7.75	7.91
891115	35	68.00	3.39	37.42	24.00	1.97	21.78	78.00	3.39	37.42	12.00	0.31	3.38	9.07	7.89
900405	36	110.00	5.49	26.50	35.00	2.88	13.91	274.00	11.92	57.55	16.50	0.42	2.04	20.71	19.55
900406	37	105.00	5.24	27.09	35.00	2.88	14.89	248.00	10.79	55.77	17.00	0.43	2.25	19.34	20.20

* Indicates that cations and anions do not lie within 10% of mean

Table C4 (cont)

Major Ion Chemistry
Canada Brick Quarry Surface Water
Location PSB

Anions

Date	Number	Chloride			Sulphate			Bicarbonate as CaCO3			Carbonate as CaCO3			Total Ions (EPM)		
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Anion	Cation	
811130	1	46.00	1.30	25.76	74.00	1.54	30.59	110.00	2.20	43.66	0.00	0.00	0.00	5.04	5.49	
820324	2	50.00	1.41	38.86	24.00	0.50	13.77	86.00	1.72	47.37	<5.00	0.00	0.00	3.63	3.79	
820813	3	242.00	6.83	48.59	175.00	3.64	25.94	160.00	3.20	22.77	19.00	0.38	2.70	14.05	14.46	
820827	4	38.00	1.07	29.78	59.00	1.23	34.12	65.00	1.30	36.10	<5.00	0.00	0.00	3.60	3.09	
820924	5	165.00	4.65	44.72	140.00	2.91	28.01	133.00	2.66	25.55	9.00	0.18	1.73	10.41	7.53	*
830921	6	1100.00	31.03	76.69	310.00	6.45	15.95	127.00	2.54	6.28	22.00	0.44	1.09	40.46	40.71	
830922	7	1060.00	29.90	76.83	290.00	6.04	15.52	122.00	2.44	6.27	27.00	0.54	1.39	38.92	40.94	
831017	8	36.00	1.02	31.28	38.00	0.79	24.37	72.00	1.44	44.34	<5.00	0.00	0.00	3.25	3.37	
831018	9	35.00	0.99	28.23	37.00	0.77	22.03	87.00	1.74	49.74	<5.00	0.00	0.00	3.50	4.39	*
840217	10	65.40	1.84	60.85	18.60	0.39	12.77	40.00	0.80	26.38	<5.00	0.00	0.00	3.03	3.34	
840218	11	66.70	1.88	55.55	19.50	0.41	11.99	55.00	1.10	32.46	<5.00	0.00	0.00	3.39	4.99	*
840930	12	140.00	3.95	47.53	74.00	1.54	18.54	129.00	2.58	31.04	12.00	0.24	2.89	8.31	8.51	
841001	13	138.00	3.89	46.46	81.00	1.69	20.13	140.00	2.80	33.41	<5.00	0.00	0.00	8.38	8.72	
850702	14	1070.00	30.18	65.82	599.00	12.47	27.20	160.00	3.20	6.98	<5.00	0.00	0.00	45.85	43.30	
850703	15	1080.00	30.46	65.74	608.00	12.66	27.32	161.00	3.22	6.95	<5.00	0.00	0.00	46.34	43.64	
851005	16	62.30	1.76	35.91	64.20	1.34	27.32	90.00	1.80	36.77	<5.00	0.00	0.00	4.89	5.53	
851006	17	63.10	1.78	33.85	64.30	1.34	25.46	107.00	2.14	40.69	<5.00	0.00	0.00	5.26	6.01	
860618	18	217.00	6.12	49.50	105.00	2.19	17.68	203.00	4.06	32.82	<5.00	0.00	0.00	12.37	11.88	
860619	19	214.00	6.04	49.83	95.00	1.98	16.33	205.00	4.10	33.84	<5.00	0.00	0.00	12.11	12.18	
861008	20	142.00	4.01	38.01	186.00	3.87	36.75	133.00	2.66	25.23	<5.00	0.00	0.00	10.54	10.14	
861009	21	150.00	4.23	38.86	193.00	4.02	36.91	132.00	2.64	24.24	<5.00	0.00	0.00	10.89	10.44	
870403	22	222.00	6.26	56.72	96.00	2.00	18.11	139.00	2.78	25.17	<5.00	0.00	0.00	11.04	10.72	
870404	23	240.00	6.77	58.21	98.00	2.04	17.55	141.00	2.82	24.24	<5.00	0.00	0.00	11.63	11.37	
870625	24	228.00	6.43	47.20	142.00	2.96	21.70	212.00	4.24	31.10	<5.00	0.00	0.00	13.63	14.24	
870626	25	223.00	6.29	46.71	145.00	3.02	22.42	208.00	4.16	30.88	<5.00	0.00	0.00	13.47	14.01	
871008	26	397.00	11.20	53.90	268.00	5.58	26.86	200.00	4.00	19.25	<5.00	0.00	0.00	20.78	20.98	
871009	27	397.00	11.20	55.63	237.00	4.93	24.51	200.00	4.00	19.86	<5.00	0.00	0.00	20.13	20.44	
880831	28	405.00	11.42	54.22	230.00	4.79	22.73	243.00	4.86	23.06	<5.00	0.00	0.00	21.07	20.15	
880901	29	400.00	11.28	52.25	260.00	5.41	25.07	245.00	4.90	22.68	<5.00	0.00	0.00	21.59	19.07	
881027	30	251.00	7.08	45.62	196.00	4.08	26.30	218.00	4.36	28.08	<5.00	0.00	0.00	15.52	15.10	
881028	31	244.00	6.88	44.93	190.00	3.96	25.83	224.00	4.48	29.24	<5.00	0.00	0.00	15.32	15.19	
890425	32	687.00	19.38	59.71	506.00	10.54	32.46	127.00	2.54	7.82	<5.00	0.00	0.00	32.45	30.68	
890426	33	710.00	20.03	60.64	510.00	10.62	32.15	119.00	2.38	7.20	<5.00	0.00	0.00	33.02	30.46	
891114	34	133.00	3.75	47.45	117.00	2.44	30.81	86.00	1.72	21.74	<5.00	0.00	0.00	7.91	7.75	
891115	35	119.00	3.36	42.53	118.00	2.46	31.13	104.00	2.08	26.34	<5.00	0.00	0.00	7.89	9.07	
900405	36	407.00	11.48	58.71	237.00	4.93	25.24	150.00	3.00	15.34	7.00	0.14	0.72	19.55	20.71	
900406	37	418.00	11.79	58.38	254.00	5.29	26.18	156.00	3.12	15.44	<5.00	0.00	0.00	20.20	19.34	

* Indicates that cations and anions do not lie within 10% of mean

MAJOR ION CHEMISTRY
PIPER DIAGRAM
CANADA BRICK PSB

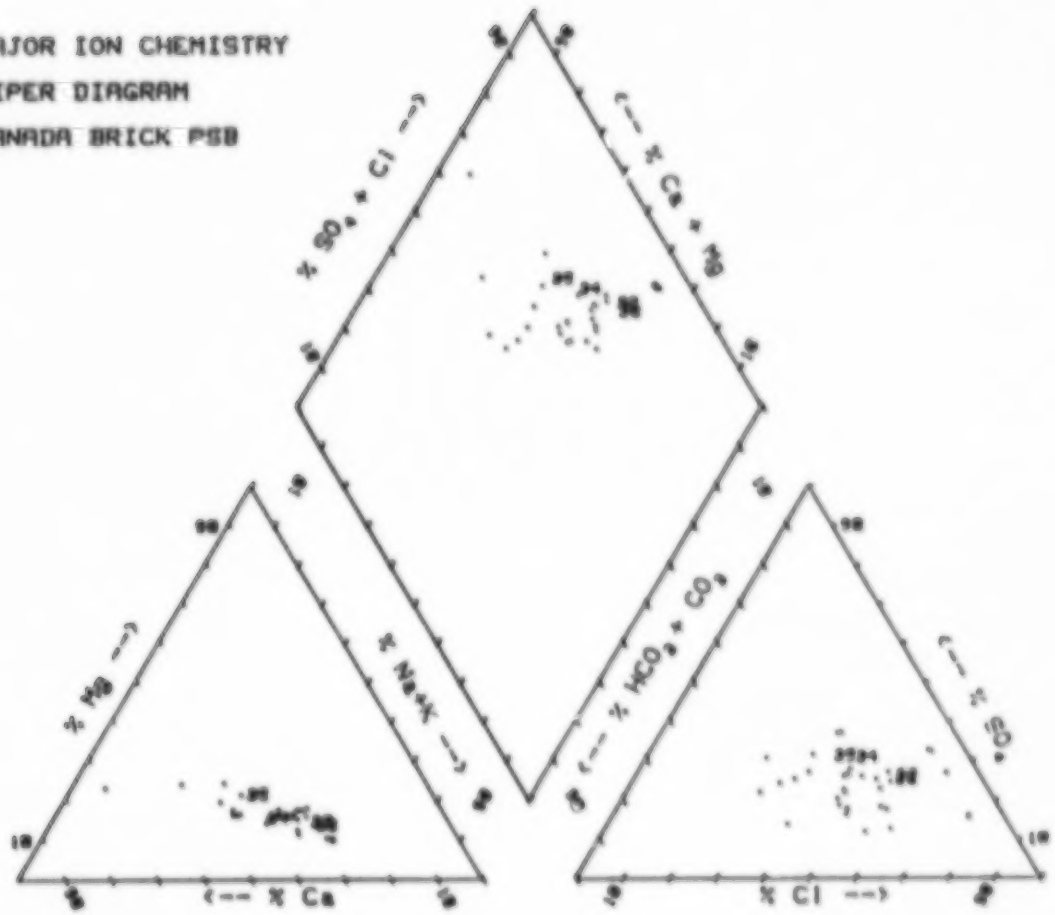


Table C5

Major Ion Chemistry
Canada Brick Quarry Surface Water
Date 13 September 1989

Cations

Locn	Number	Calcium			Magnesium			Sodium			Potassium			Total Ions (EPM)	
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Cation	Anion
CPO	1	133.00	6.64	29.77	55.00	4.53	20.30	243.00	10.57	47.41	22.00	0.56	2.52	22.30	22.48
POND	2	200.00	9.98	24.60	41.00	3.37	8.32	595.00	25.88	63.80	52.00	1.33	3.28	40.56	43.46
OCC	3	228.00	11.38	26.74	39.00	3.21	7.54	610.00	26.53	62.36	56.00	1.43	3.37	42.55	44.96
DSC	4	198.00	9.88	27.33	40.00	3.29	9.11	500.00	21.75	60.21	47.00	1.20	3.33	36.12	38.82

Anions

Locn	Number	Chloride			Sulphate			Bicarbonate as CaCO3			Carbonate as CaCO3			Total Ions (EPM)	
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Anion	Cation
CPO	1	454.00	12.81	%.96	219.00	4.56	20.28	256.00	5.12	22.76	<5.00	0.00	0.00	22.48	22.30
POND	2	918.00	25.89	59.58	788.00	16.41	37.75	58.00	1.16	2.67	<5.00	0.00	0.00	43.46	40.56
OCC	3	921.00	25.98	57.78	853.00	17.76	39.50	61.00	1.22	2.71	<5.00	0.00	0.00	44.96	42.55
DSC	4	795.00	22.42	57.77	701.00	14.60	37.60	90.00	1.80	4.64	<5.00	0.00	0.00	38.82	36.12

* Indicates that cations and anions do not lie within 10% of mean

Figure C6

13 SEPTEMBER 1989

MAJOR ION CHEMISTRY
PIPER DIAGRAM
SURFACE WATERS 890913

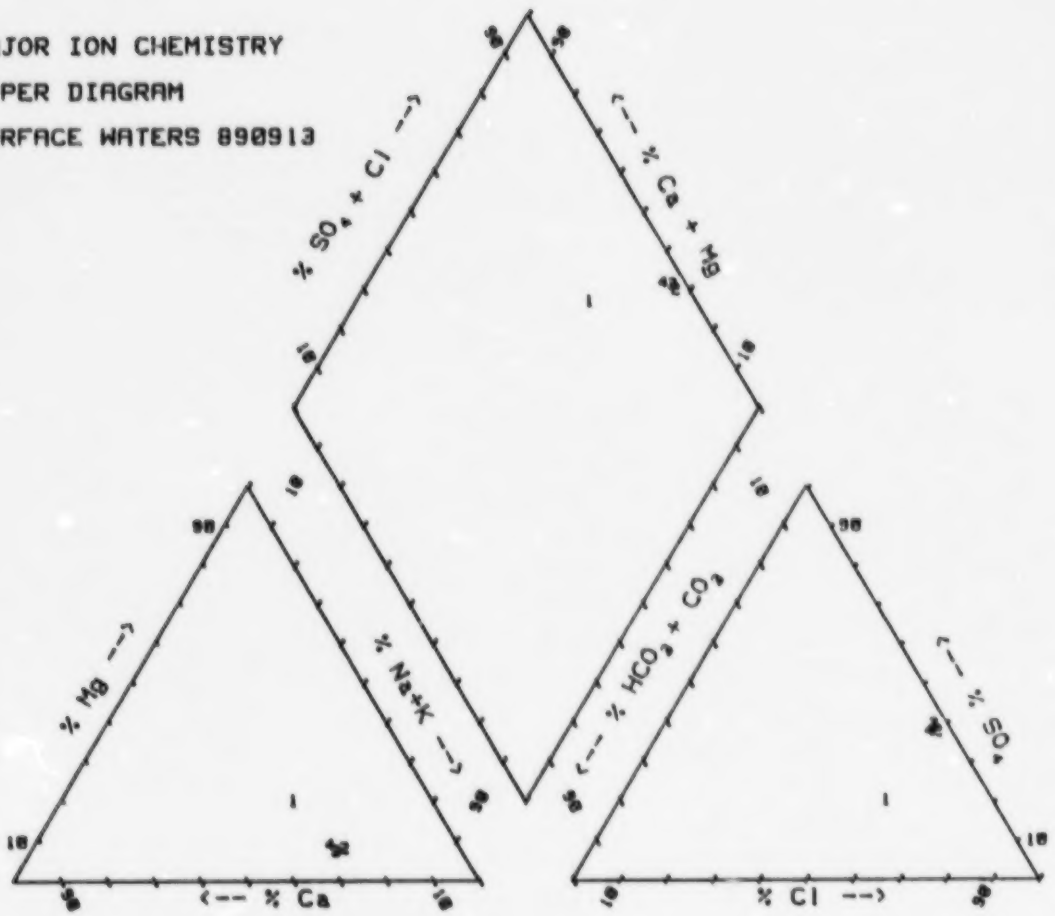


Table C6

Major Ion Chemistry
Canada Brick Quarry Surface Water
Date 5 April 1990

Cations

		Calcium			Magnesium			Sodium			Potassium			Total Ions (EPM)	
Locn	Number	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Cation	Anion
HPD	3	97.00	4.84	35.09	42.00	3.46	25.05	117.00	5.09	36.89	16.00	0.41	2.97	13.79	13.12
POND	4	101.00	5.04	27.79	25.00	2.06	11.34	242.00	10.53	58.04	20.00	0.51	2.82	18.14	17.07
OCC	5	99.00	4.94	27.67	26.00	2.14	11.98	236.00	10.27	57.49	20.00	0.51	2.86	17.86	16.50
SPD	6	83.00	4.14	33.09	32.00	2.63	21.04	122.00	5.31	42.40	17.00	0.43	3.47	12.52	11.67

Anions

		Chloride			Sulphate			Bicarbonate as CaCO3			Carbonate as CaCO3			Total Ions (EPM)	
Locn	Number	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Anion	Cation
HPD	3	245.00	6.91	52.66	188.00	3.91	29.83	115.00	2.30	17.52	<5.00	0.00	0.00	13.12	13.79
POND	4	278.00	7.84	45.92	334.00	6.95	40.73	114.00	2.28	13.35	<5.00	0.00	0.00	17.07	18.14
OCC	5	265.00	7.47	45.30	323.00	6.72	40.76	115.00	2.30	13.93	<5.00	0.00	0.00	16.50	17.86
SPD	6	140.00	3.95	33.84	271.00	5.64	48.35	104.00	2.08	17.82	<5.00	0.00	0.00	11.67	12.52

* Indicates that cations and anions do not lie within 10% of mean

Figure C7

5 APRIL 1990

MAJOR ION CHEMISTRY
PIPER DIAGRAM
SURFACE WATERS 900405

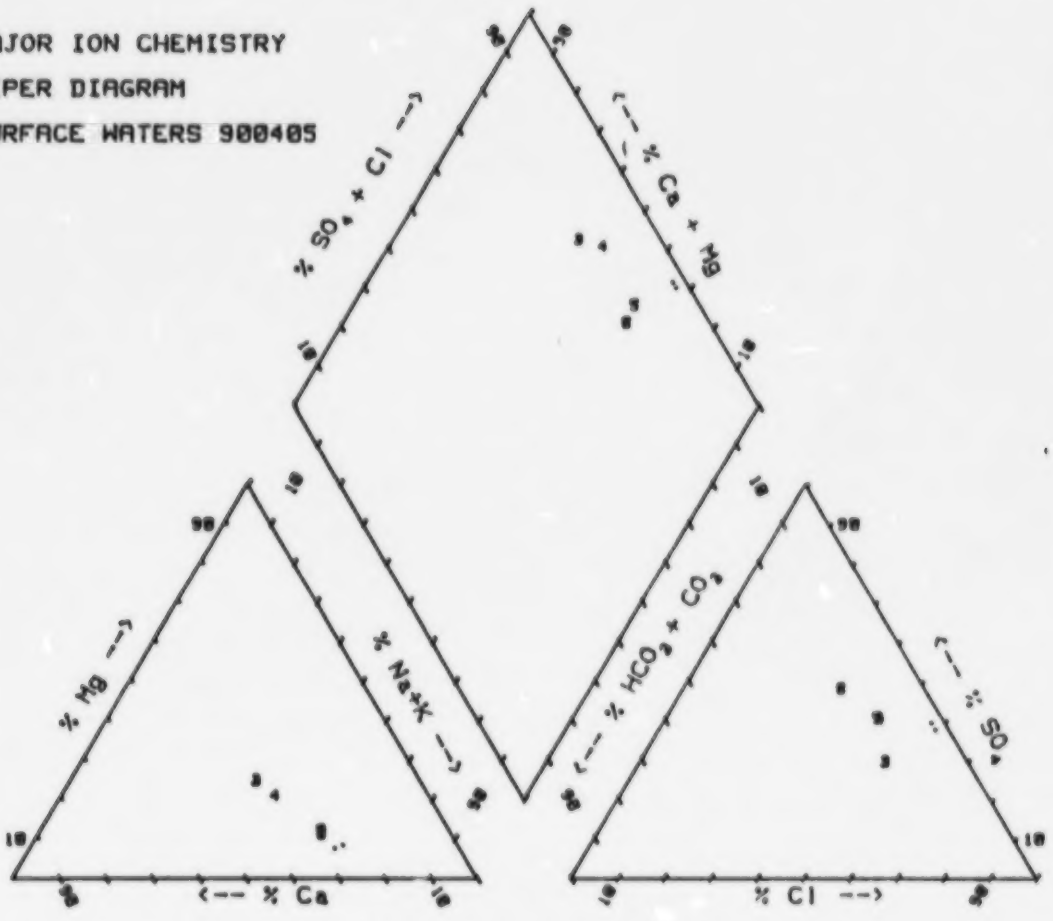


Table C7

Major Ion Chemistry
Canada Brick Quarry Surface Water
Date 6 April 1990

Cations

Locn	Number	Calcium			Magnesium			Sodium			Potassium			Total Ions (EPM)	
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Cation	Anion
SUMP	1	200.00	9.98	37.78	19.00	1.56	5.92	316.00	13.75	52.04	44.00	1.13	4.26	26.41	25.44
SPD	2	83.00	4.14	32.70	32.00	2.63	20.79	126.00	5.48	43.27	16.00	0.41	3.23	12.66	11.73
HPD	3	99.00	4.94	35.25	42.00	3.46	24.66	118.00	5.13	36.62	19.00	0.49	3.47	14.01	13.43
POND	4	103.00	5.14	29.47	27.00	2.22	12.74	220.00	9.57	54.86	20.00	0.51	2.93	17.44	17.48
OCC	5	99.00	4.94	27.31	27.00	2.22	12.28	240.00	10.44	57.72	19.00	0.49	2.69	18.09	17.02

Anions

Locn	Number	Chloride			Sulphate			Bicarbonate as CaCO3			Carbonate as CaCO3			Total Ions (EPM)	
		mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	mg/L	EPM	%EPM	Anion	Cation
SUMP	1	348.00	9.82	38.59	709.00	14.76	58.03	28.00	0.56	2.20	15.00	0.30	1.18	25.44	26.41
SPD	2	137.00	3.86	32.94	278.00	5.79	49.34	104.00	2.08	17.72	<5.00	0.00	0.00	11.73	12.66
HPD	3	247.00	6.97	51.88	200.00	4.16	31.01	115.00	2.30	17.12	<5.00	0.00	0.00	13.43	14.01
POND	4	280.00	7.90	45.17	351.00	7.31	41.80	114.00	2.28	13.03	<5.00	0.00	0.00	17.48	17.44
OCC	5	274.00	7.73	45.40	336.00	7.00	41.09	115.00	2.30	13.51	<5.00	0.00	0.00	17.02	18.09

* Indicates that cations and anions do not lie within 10% of mean

Figure C8

6 APRIL 1990

MAJOR ION CHEMISTRY
PIPER DIAGRAM
SURFACE WATERS UNFILT.